# DRILL PRESS TABLE UPGRADE

PRECISION FENCE SYSTEM • DUST PICKUP • BUILT-IN STORAGE • EASY CLAMPING

# ShopNotes®

Vol. 16 Issue 94

# TABLE SAW SECRETS

CUTTING THIN STRIPS—SAFE, EASY, & ACCURATE

## + PERFECT MITERS

## 10 TOP TIPS & TECHNIQUES

Shop-Built Jig Guarantees Quick Setup

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## PLUS!

## ROUTER WORKSHOP

NO-FUSS MORTISING JIG — FAST, FOOLPROOF RESULTS EVERY TIME

## SETTING UP SHOP

DOUBLE YOUR SPACE, WITHOUT ADDING ON

A Publication of August Home Publishing

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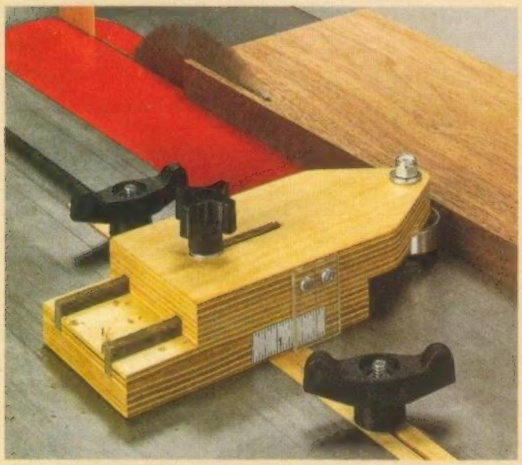

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# Cutoffs

What's your favorite woodworking tool? For many woodworkers, either the table saw or router would come to mind first.

And I wouldn't disagree. But right near the top of my list is the drill press. For such a basic-looking tool, it can do so much: like drilling, sanding, and mortising.

But to get the most out of a drill press, you need to transform it into a precision woodworking tool. The table and fence system you see at left is the perfect upgrade.

For starters, the table offers plenty of worksurface — it's over two feet wide. That's big enough to support just about any size workpiece you'll run across.

Then, to give you more control and more accurate drilling, we designed a built-in, two-part clamping system. For small pieces, a couple sections of T-track in the top allow you to position a toggle clamp right up close to the bit. For larger pieces that need extra holding power, you can slip a couple of bar clamps through the slots in the top.

The table also includes a couple of not-so-obvious features. A full-extension drawer keeps small tools and accessories within easy reach. And underneath the table you'll find a port for dust collection.

Terry


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from our Readers

# Tips for Your Shop

## Router Table Fence Storage

Whenever I'm working at the router table, I always seem to spend a lot of time looking for bits, wrenches, and collets. I decided to solve that problem by building a "multitasking" fence with built-in storage for my router table.

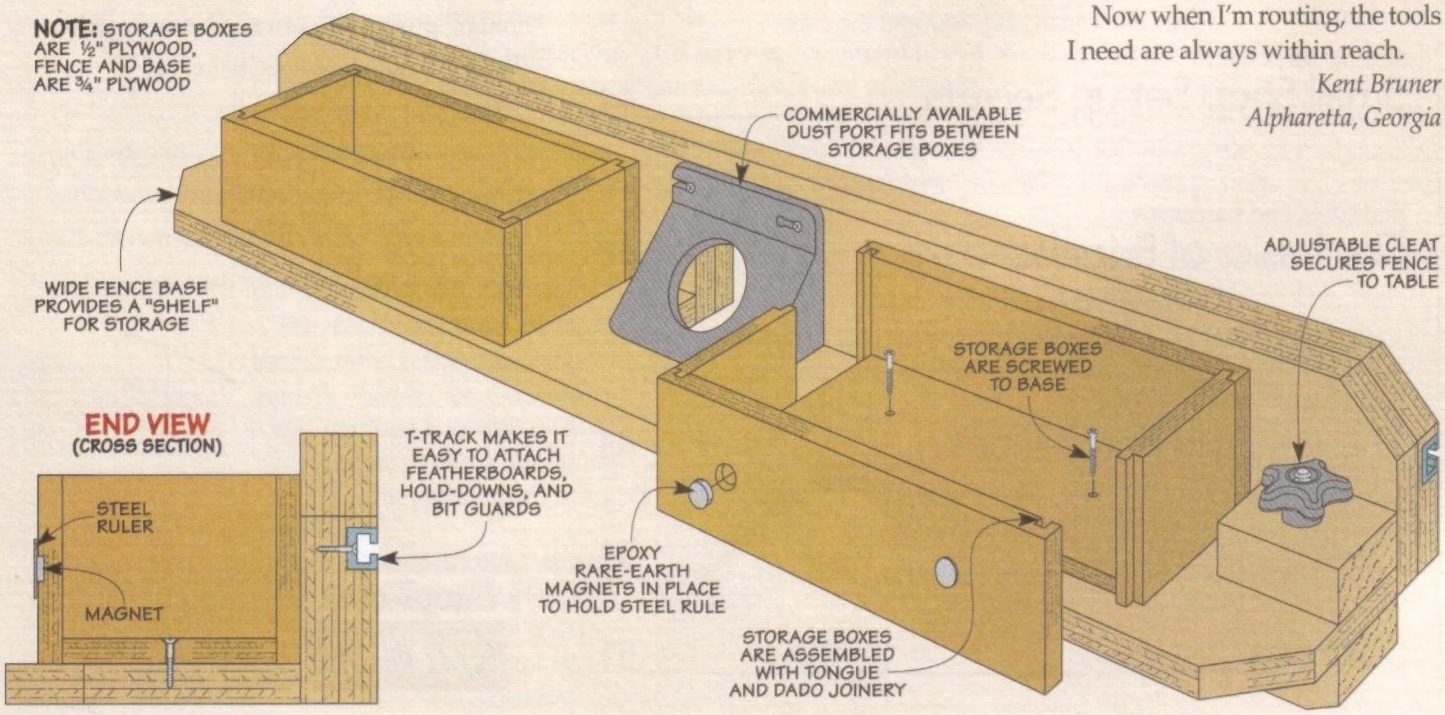
As you can see above, I used a wide base at the rear of the fence. This gives you a place for the dust collection port, but more importantly, it provides real estate for adding some storage options.

Two small trays sit behind the fence. One has bit inserts to hold my router bits. And the other helps me keep track of all those things I always seem to be looking for, like wrenches, pencils, and other accessories.

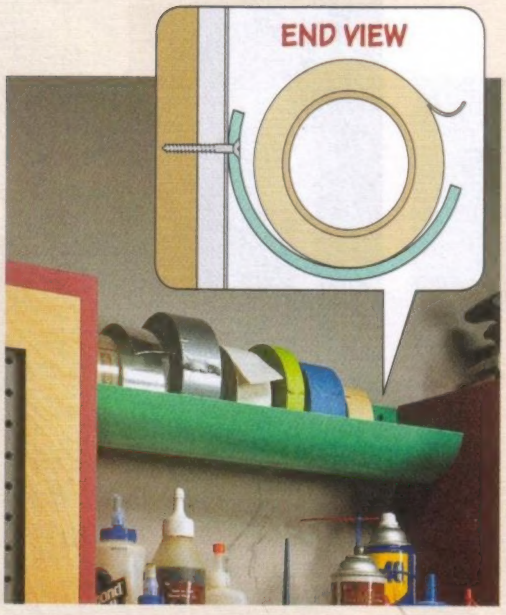
I used screws to fasten the trays to the base. A couple of small rare-earth magnets on the back hold a steel ruler I use for setup.

Now when I'm routing, the tools I need are always within reach.

*Kent Bruner*
*Alpharetta, Georgia*



## PVC Tape Trough

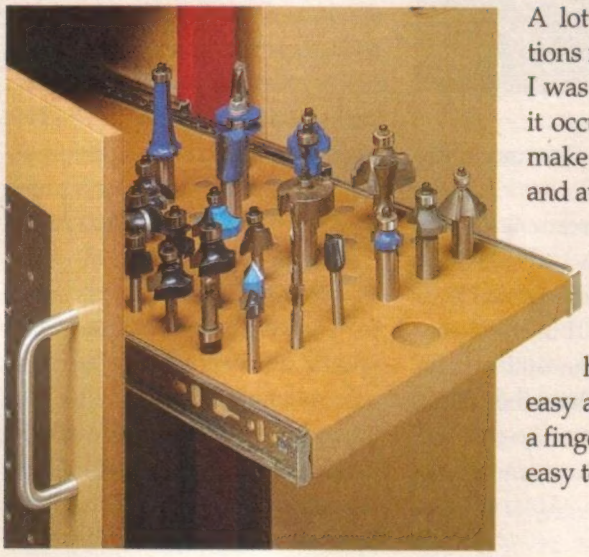



Finding a good way to store the assorted rolls of tape in my shop has always been frustrating. I wanted a way to make every roll accessible. A section of 6"-dia. drain pipe was the answer.

Just carefully rip the pipe in two on the table saw to make a handy trough like you see in the photo. Long screws secure it to the wall studs. Now my "library" of tape rolls sits like books on a shelf.

*Dave Juday*
*Sycamore, Illinois*

## Pull-Out Router Bit Tray



A lot of router bit storage solutions involve building drawers. As I was reorganizing my router bits, it occurred to me that I could just make a tray from a piece of MDF and avoid building a drawer.

All you need to do is mount drawer slides to the edges of the tray and install it in a cabinet. Slightly oversized holes hold the drill bits for easy access and organization. And a finger hole near the edge makes it easy to slide the tray out.

*Michael Peavey*
*Wilson, North Carolina*

## Submit Your Tips

If you have an original shop tip, we would like to hear from you and consider publishing your tip in one or more of our publications. Just go online to our web site at *www.ShopNotes.com* and click on the link, "SUBMIT A TIP." Or you can mail your tip to: *ShopNotes* Tips for Your Shop, 2200 Grand Avenue, Des Moines, IA 50312. Please include your name, address, and daytime phone number (in case we have any questions).
We will pay up to $200 if we publish your tip.

### The Winner!

Congratulations to *Scott Kent* of Melbourne, Florida. His shop-made rollers make a handy addition to a benchtop planer. The rollers make planing long boards a little less cumbersome. His tip was selected as winner of the *Porter-Cable* router just like the one shown at right.

To find out how you could win a *Porter-Cable* router, check out the information above. Your tip just might be a winner.

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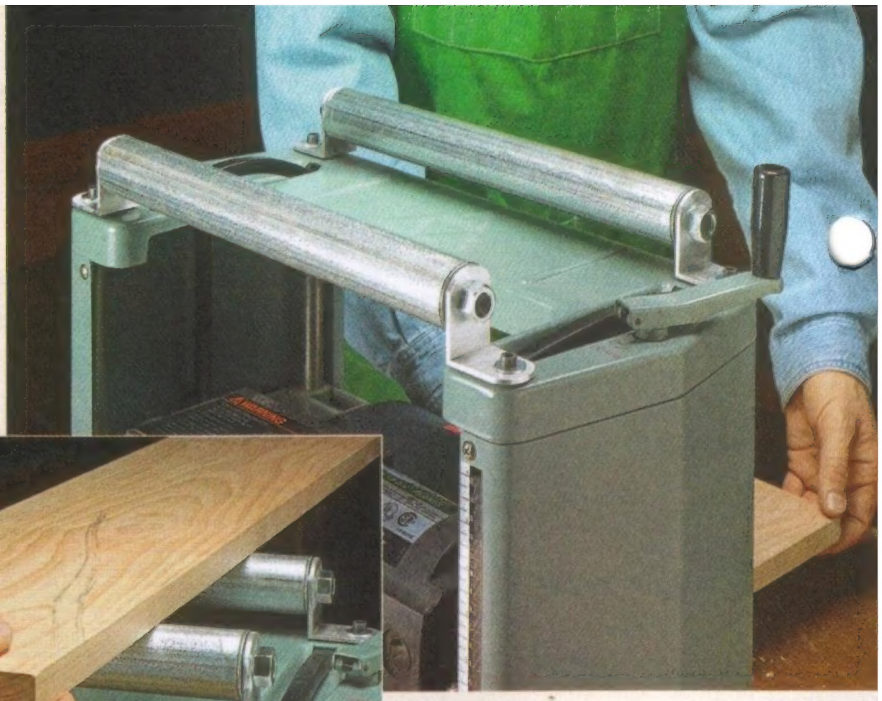
# Shop-Made Planer Rollers

One of the features I've always liked on planers was the rollers on top. They're so convenient when planing long boards and make a convenient staging area for workpieces. But my planer didn't come with these handy rollers.

Unhappy with add-on rollers (and their prices), and unsure about the rigidity of shop-made versions using PVC pipe, I designed my own. My design is inexpensive, strong, and you can make them any length.

The actual roller is made from 1¼" EMT electrical conduit. It's nice and strong but still lightweight. I found some flanged bearings at my hardware store that were just the right fit for the 1⅜" inside diameter of the conduit (drawing below).

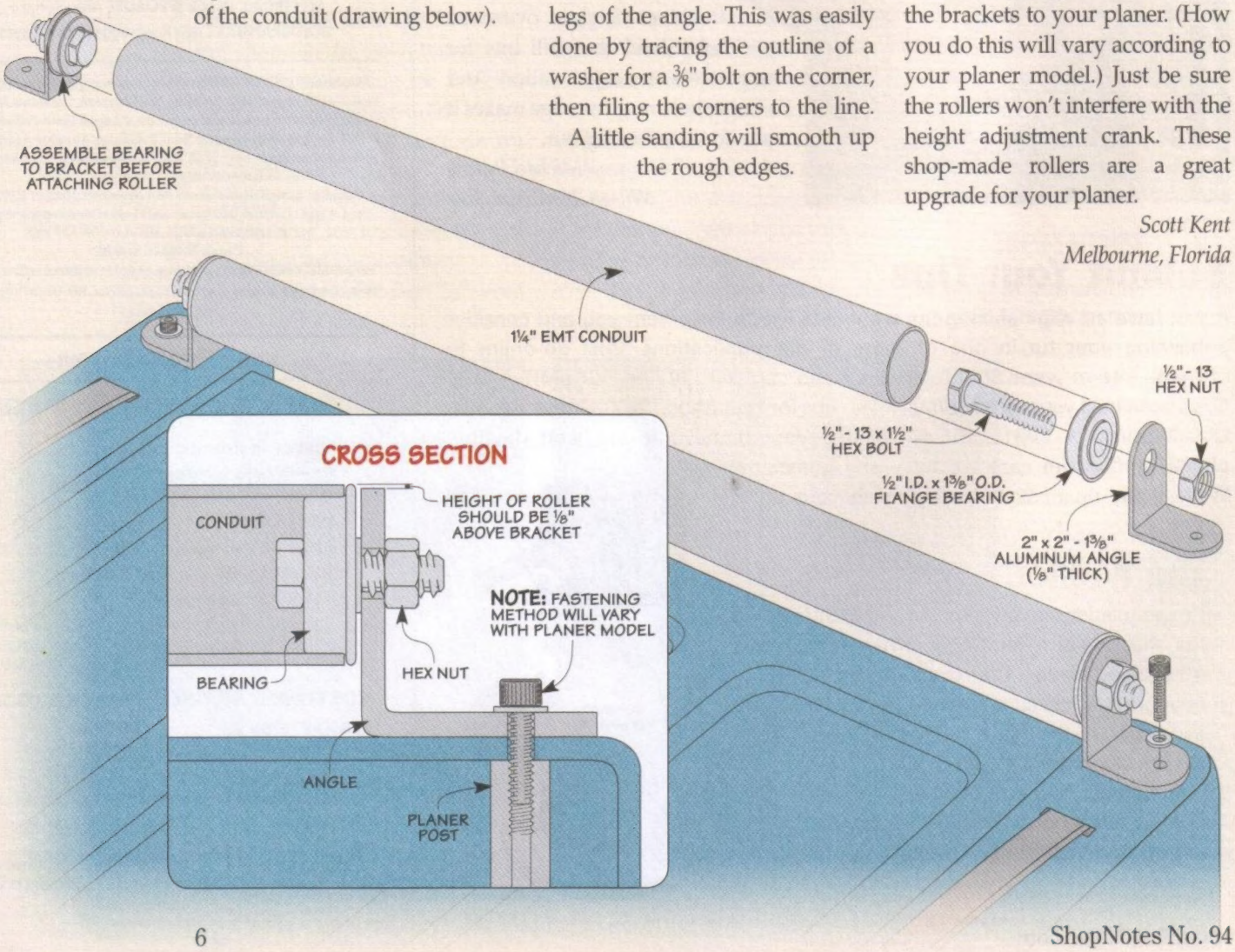


You'll need a couple of mounting brackets for the roller. They're made from short sections of 2" x 2" aluminum angle. I took the time to round over the corners on both legs of the angle. This was easily done by tracing the outline of a washer for a ⅜" bolt on the corner, then filing the corners to the line. A little sanding will smooth up the rough edges.

When it comes time for drilling the hole for mounting the roller to the bracket, locate it so the top of the roller sits above the highest point on the aluminum angle. This allows you to slide boards freely without having to worry about marring them on the bracket if they roll toward the end.

The last thing to do is mount the brackets to your planer. (How you do this will vary according to your planer model.) Just be sure the rollers won't interfere with the height adjustment crank. These shop-made rollers are a great upgrade for your planer.

*Scott Kent*
*Melbourne, Florida*



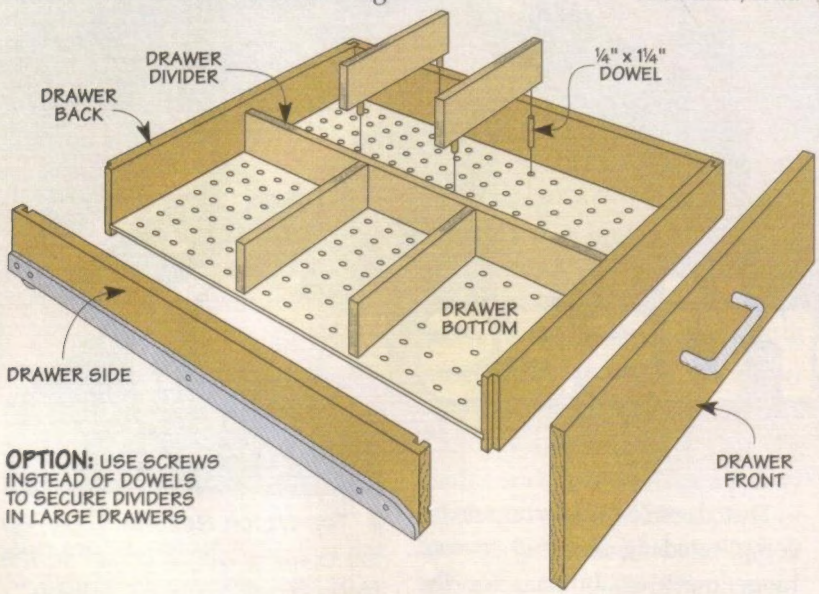
# Pegboard Drawer Bottoms

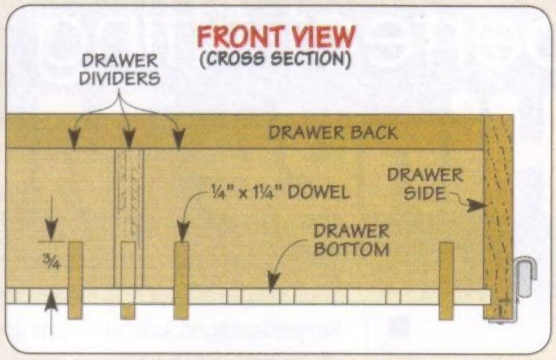
While building some drawers for added storage under my workbench, I ran out of the ¼" hardboard I normally use for the drawer bottoms. Looking around the shop for a suitable substitute, I found some ¼" pegboard. It seemed sturdy enough for my purposes, so that's what I used.

The pegboard had a white melamine surface on it. It helps "lighten up" the inside of the drawers and it's easier to keep clean. But there's another big advantage with pegboard. You can make use of the holes by adding dividers for the drawers. This helps keep things organized, as you can see in the photo at right.

On shallow drawers, you can simply use ¼"-dia. dowels on the bottom of the partitions to locate them in the holes. On deeper drawers, I've found that #8 x ¾" roundhead woodscrews work perfectly to fasten them.

*Randy Maxey*
*Urbandale, Iowa*




## Quick Tips

▲ **Dick Berry** of Albuquerque, New Mexico, found that a 3" x 3" pad of sticky notes fits just right (between the fence faces) on top of his rip fence. Now jotting down dimensions and rough calculations is a breeze.

◀ **Bob Zimmerman** of Des Moines, Iowa, came up with this inexpensive panel carrier. All you need are a couple of bicycle storage hooks, a 2x4, a PVC pipe handle, and some rope.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Routing a hinge mortise is a breeze with a simple jig and the right technique.

# no-fuss, perfect-fitting Hinge Mortises

▲ ***Top-Notch Results.*** *Clean up the corners with a chisel so the hinge slides perfectly in place.*

Recently faced with the challenge of cutting a lot of hinge mortises, I was looking for a quick way to get the job done. So I turned to my router to cut flat-bottomed mortises without a lot of trouble.

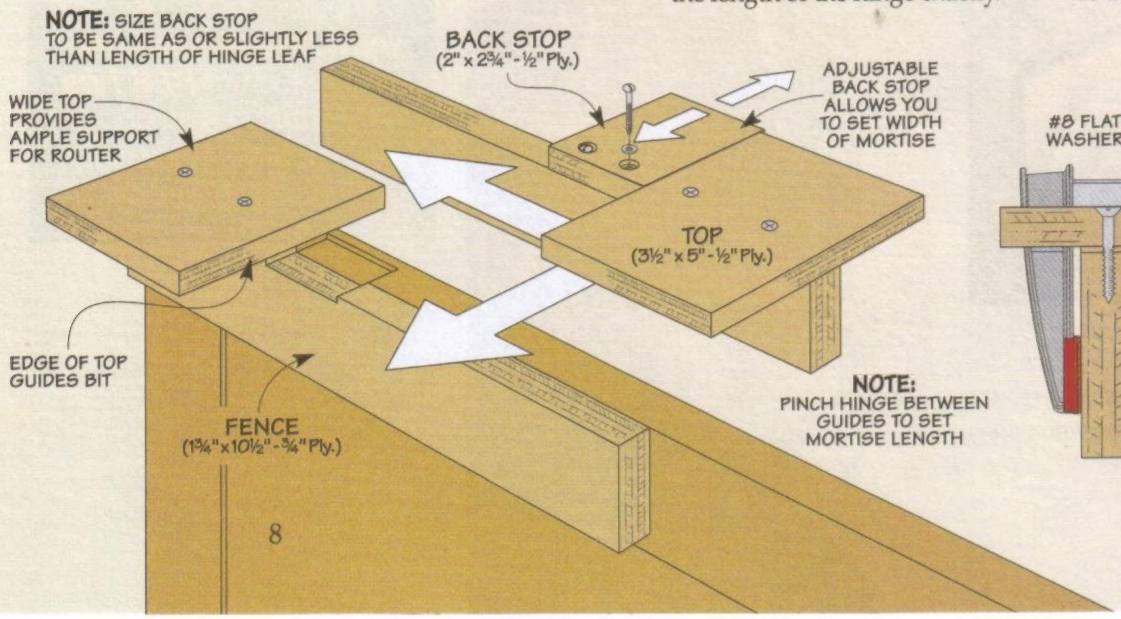
The problem is free-handing a large router to cut out the mortise can be tricky. For one thing, it's tough to balance the router on the narrow edge of a door. And second, even the slightest slip can ruin the mortise.

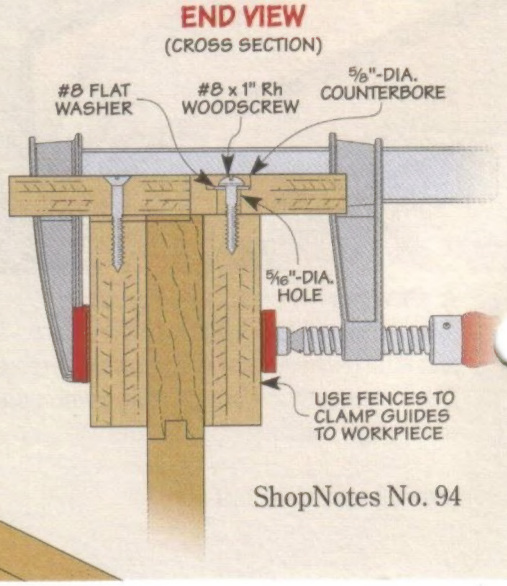
That doesn't mean you need a complicated jig or setup to rout hinge mortises. In fact, for the technique you see here, all it takes is a simple, two-part jig and an inexpensive router bit.

**The Jig.** I didn't want the jig to be locked in to a specific size hinge. So I designed the jig as a pair of overlapping guides, as in the drawing below. This allows the guides to straddle the door and slide together (or apart) to match the length of the hinge exactly.

Each guide consists of two parts: a fence and a top. The fence registers the guide on the face of the door. And it provides a place to clamp the guides in place.

Together, the tops form a large, stable platform to support the router as you cut the mortise. The inside edge of each top also serves as the guide edge for the bit.



**Back Stop.** I also attached a simple back stop to one of the guides. With this, you can rout a mortise that exactly matches the width of the hinge leaf. A pair of screws and washers in the back stop are set in oversized holes. This allows you to fine tune the mortise width.

The bit I use for mortising is a short, top-bearing, pattern bit. And you can read more about it in the box at the lower right.

## ROUTING MORTISES

Before getting into the actual routing, I'd like to talk about the overall process of mounting the hinges. To save some time and effort, I cut the mortises in just the door — rather than the door *and* case.

When routing the mortises this way, you'll cut them to match half the thickness of the hinge barrel. This creates just the right-sized gap around the door when the hinge is mounted to the case.

**Setting up the Jig.** The first step in the process of making the hinge mortise is completing a simple layout. Since I rely on the jig and hinge to size the mortise, all that's necessary is to mark the location of one end of the hinge mortise (upper photo at right).

Now, clamp one part of the jig so the inside edge is right on this line. (I clamp the "tail" end first so the clamp won't interfere with the other half of the jig.)

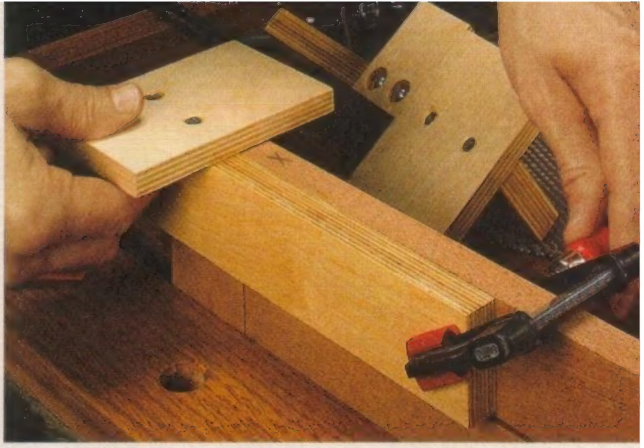
To set the length of the mortise, I use the hinge as a gauge to position the other part of the jig. You can see this in the lower photo.

The only other setup step to take care of is positioning the back stop. Here, I use a combination square to make sure the stop is parallel to the edge of the door.

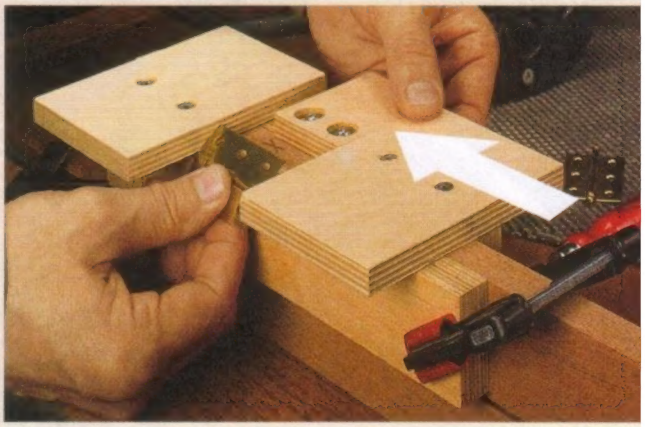
**Two-step Routing.** At this point, you're ready to rout the mortise. And you'll be surprised at how quickly this goes.

For most mortises, removing the waste only takes two passes. You can see what I'm talking about in the photo below. The first pass defines the perimeter of the mortise. It's routed from left to right in a U-shape. The second pass clears away the rest of the waste.

**Clean up the Corners.** After the routing is complete, all that's left is a little handwork. But don't remove the jig just yet. You can use it as a guide to clean up the corners with a chisel. This way, you can be sure the corners are square with the rest of the mortise.

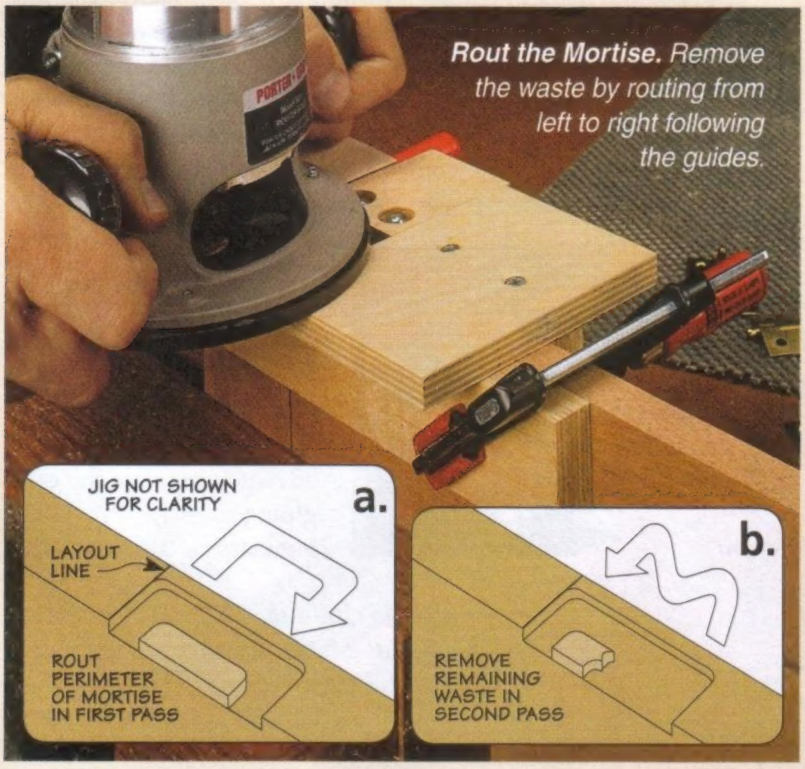


▲ ***Jig Setup.*** *After marking the location of the hinge on the door, you can position one guide on the mark and clamp it in place.*



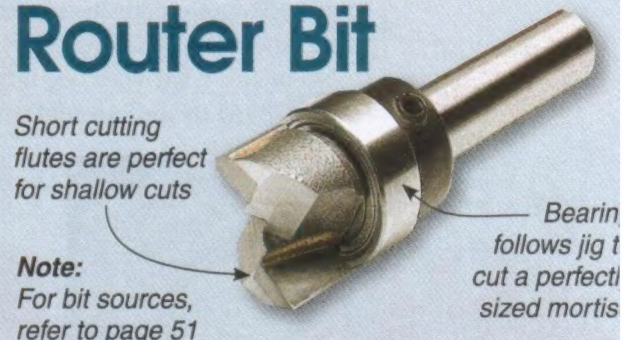
▲ ***Mortise Length.*** *Use a hinge to set the position of the second guide. And after adjusting the back stop, clamp both guides at each end.*

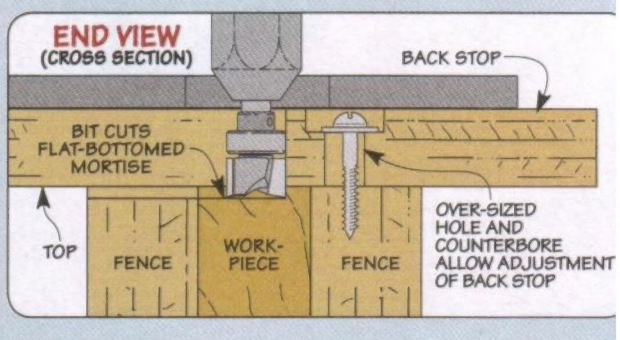
All in all, the whole process only takes a few minutes. And the result is a mortise that perfectly matches the hinge, as you see in the inset photo on the opposite page.




***Rout the Mortise.*** *Remove the waste by routing from left to right following the guides.*

## a close look at the Router Bit



# tips & techniques for ripping Thin Strips

## Cutting thin strips is a challenge. These tips and techniques will guarantee safe, accurate results.

It seems like many of the projects I build call for thin strips of wood. Sometimes it's several thin strips to glue up into a bent lamination or just a few to act as dividers in a small drawer. And even if all I need are a couple strips to cover up some plywood edges, cutting them on the table saw can be a challenge.

No matter what your need, the goal is to get the best results with accuracy and safety in mind. The nice thing is, all this takes is the right setup, some handy jigs, and a few simple tips and techniques.

### START WITH THE BLADE

One thing about ripping thin strips that's often overlooked is the saw blade. In most cases, a standard combination blade will give you great results. And if this is the saw blade you use for most of your work, I'd stick with it. But there are a couple of other blades you may want to consider.

**Specialty Saw Blades.** The saw blades in the photos at the lower left address a couple of thin strip issues. The blade at the far left is specifically designed for making rip cuts that result in surfaces smooth enough to glue up. Well, one of the main goals of ripping thin strips is to end up with a workpiece that's smooth and free of blade marks and burning. And *Freud's Glue Line Rip* blade gives you just that. This can be a real advantage when it comes to gluing up strips into a bent lamination. If you have

◀ ***Saw Blade Options.*** *A specialized ripping blade (far left blade) makes for smoother strips and faster cutting. Using a thin-kerf combination blade will result in more strips per workpiece.*

to cut extra-thick strips and then plane or sand them smooth, your bent lamination may not end up looking like a single piece of wood. The glue line rip blade ensures that the only material you "lose" is the thickness of the saw kerf.

**Thin Kerf.** The thin-kerf blade in the photo on the opposite page can also result in less waste. With a thickness of 3/32", you get one extra thin strip for every four you cut (for 1/8"-thick strips). This can save you a fair amount of material if you have a lot of thin strips to cut.

**Insert.** Regardless of the saw blade you decide to use, you'll want to install a zero-clearance insert with a built-in splitter. The one I use is shown in the box below. Besides preventing the thin strips from falling between the insert and blade, the added splitter keeps the strips from pinching the saw blade and kicking back.

## SETTING UP FOR THE CUT

With your saw blade and new insert installed, you're just about ready to start cutting strips. But to get the best results, it's a good idea to make sure the saw is tuned up.

▲ ***Set the Blade to 90°.*** *A drafting triangle makes it a snap to square the saw blade to the table.*

And this is just a matter of checking a couple key settings.

**Square the Blade.** The first thing to take a look at is the blade angle. You want to make sure the saw blade is set at a perfect 90° angle to the table (photo above). The reason for this is simple. A slight tilt to the blade will result in a strip that's thinner along one edge than the other. This can cause problems if you glue up a set of strips like this for a bent lamination.

**Rip Fence.** The other setting you'll want to check has to do with the rip fence. If the fence isn't parallel to the saw blade, you'll get blade marks and burned edges as well as an increased risk of kickback. A simple dial indicator makes quick work of ensuring your rip fence is set right (photo above). With the saw set up, you're ready to turn the page and start ripping thin strips with ease.

▲ ***Dead-On Fence.*** *A dial indicator makes quick work of checking the front and rear of the rip fence to ensure that it's parallel to the miter slot (and saw blade).*

# Zero-Clearance Insert & Splitter

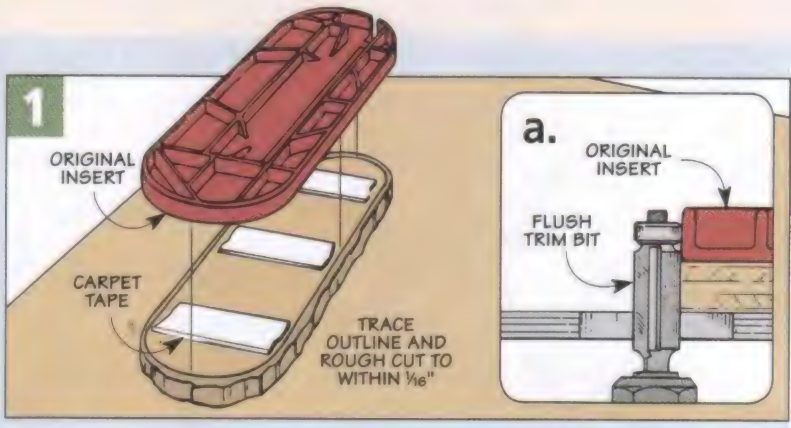
A zero-clearance insert with a splitter is one of the big keys to successfully ripping thin strips. The insert prevents a strip from getting trapped between the blade and the opening. And the splitter keeps the strip from binding on the blade.

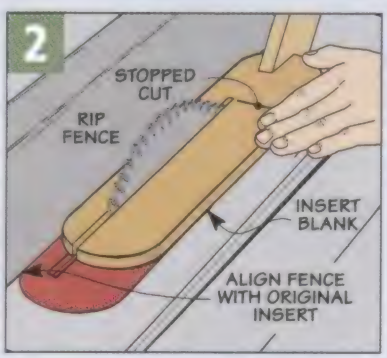
To make a new insert for your table saw, you'll need to start with a blank that matches the thickness of your stock insert. (Note: If the material is thinner, you can add screws to the bottom so you can adjust it perfectly flush with the saw table.)

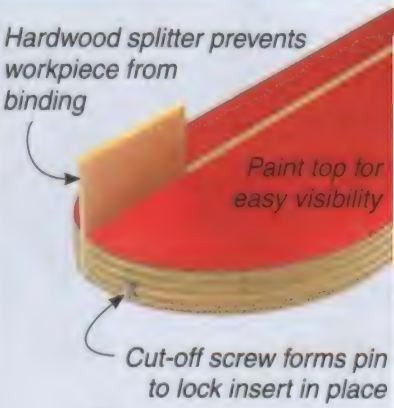
After tracing the outline of the original insert on the blank, cut away most of the waste (Figure 1). Then use a flush trim bit in the router table to create an identical insert (Figure 1a).

Ripping a slot in the new insert is just a matter of carefully aligning the fence with the edge of the original insert and making a stopped cut, as in Figure 2.

Finally, cut a hardwood splitter to size, sand one end to a point and glue it into the kerf with the point facing the blade (photo at right).



how to rip

# Thin Strips

Even after truing up your saw and selecting the blade, there's a little more to ripping thin strips than just setting the fence and cutting. First, I'll mention a few basic techniques that apply. After covering these, I'll show you two shop-made jigs I use to handle cutting either short or long thin strips.

## THE BASICS

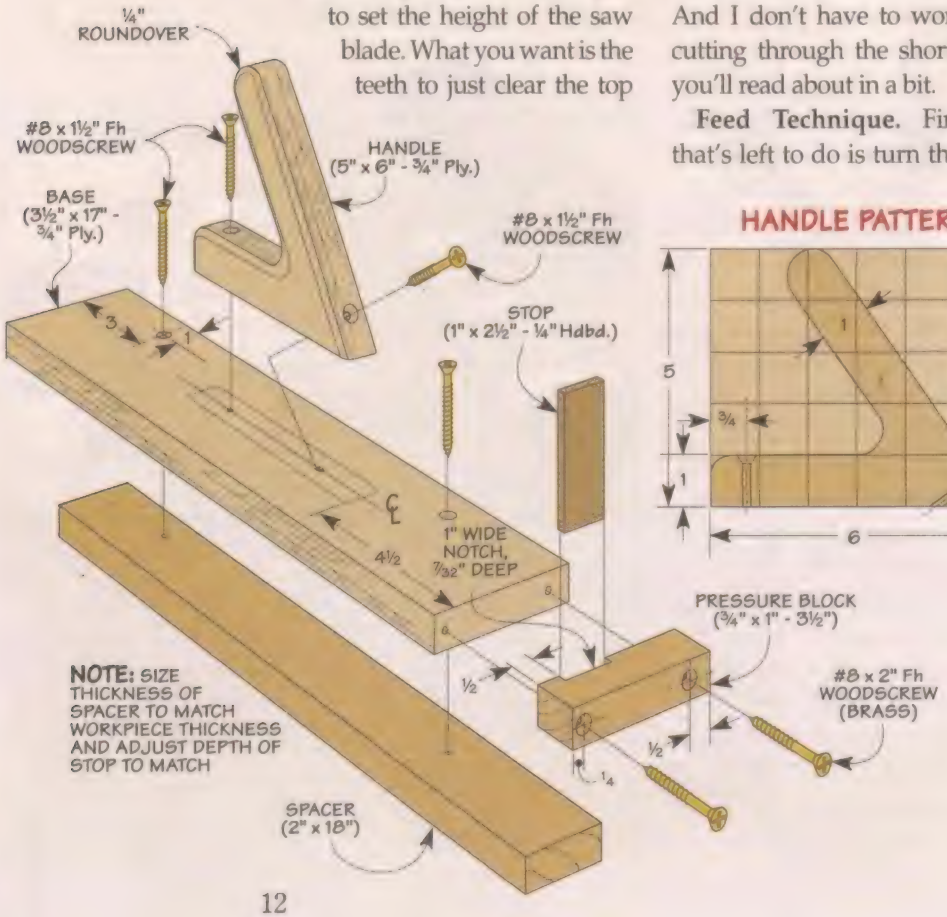
When it comes to ripping thin strips, one of the most important things to do before you start is set up some type of outfeed table. The reason for this is simple.

Without support, the strips are going to fall off the back edge of the saw table and I don't want to give myself any reason to reach over the saw blade and try to catch them. Plus, having them pile up on the floor is just a mess I'll have to deal with later.

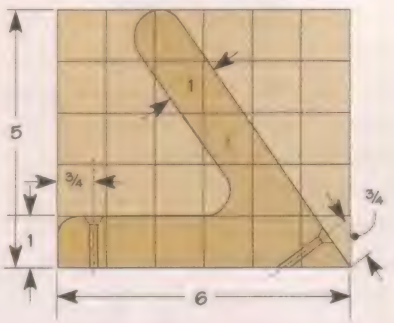
**Blade Height.** With an outfeed table in place, the next step is to set the height of the saw blade. What you want is the teeth to just clear the top surface of the workpiece. This way, there's not too much blade exposed. And I don't have to worry about cutting through the short strip jig you'll read about in a bit.

**Feed Technique.** Finally, all that's left to do is turn the saw on and feed the workpiece through. Now, depending on the jig you use, how you do this will vary. The main thing is to use a smooth, even feed rate. This ensures the saw blade won't burn the edges or leave tooth marks.

▲ ***Short Strip Jig.*** *A replaceable stop (inset photo) pushes the workpiece through the blade when ripping short strips.*




### HANDLE PATTERN

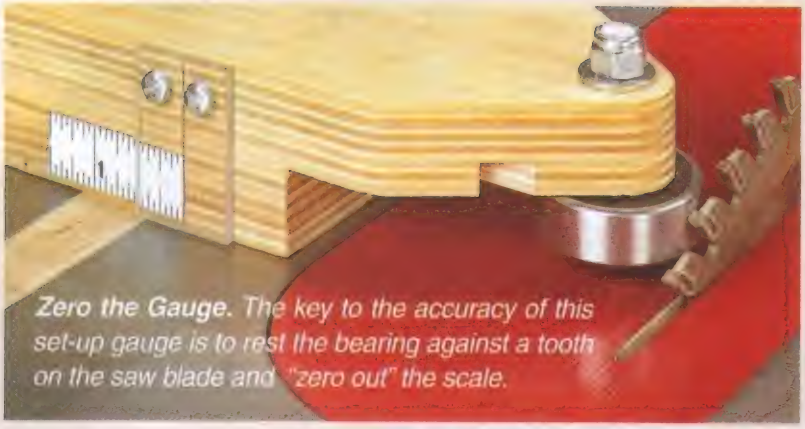



## SHORT STRIPS

As I mentioned before, the actual cutting technique you use depends on whether you're ripping short strips or long ones. For strips that are less than 30" long, I use the simple jig shown in the photos above and the drawing at left.

This jig works like a big push block that rides against the rip fence as you make the cut. You only have to set the rip fence once, and your strips will all be identical in thickness. And there's virtually no chance of kickback.

As you can see, a wide base captures the workpiece beneath it.



**Zero the Gauge.** The key to the accuracy of this set-up gauge is to rest the bearing against a tooth on the saw blade and "zero out" the scale.

**Ripping a Long Strip.** Position the jig in front of the blade and tighten it in place. Then slide a workpiece up to the bearing. Snug up the rip fence on the workpiece and make the cut.

And a replaceable stop hooks over the end of the workpiece to push it through the saw blade (inset photo on the opposite page).

To keep the jig from rocking, the spacer that's attached to the bottom of the jig is the same thickness as the workpiece. You'll want to make several spacers to match common stock thicknesses.

## LONG STRIPS

The previous jig works great for short strips. But if the strips you need are longer, I turn to the jig shown in the photos above and drawing below.

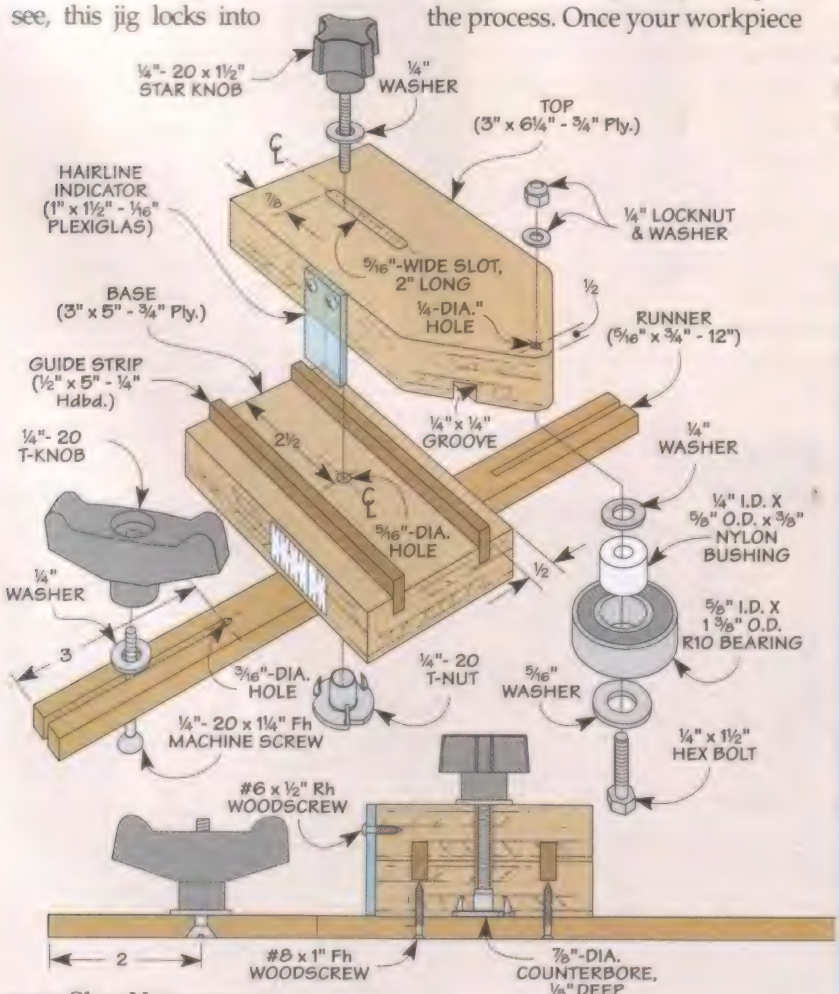
**Details.** As you can see, this jig locks into the miter slot to the left of the saw blade. A "rub" bearing fixed to the end of a sliding top is used to gauge the thickness of the strips.

The bearing allows the workpiece to slide without binding. By adding a scale and an adjustment slot in the top of the jig, you can set the exact thickness of the strip you want to rip after zeroing out the gauge (upper left photo).

**Using the Jig.** To rip a strip, set the workpiece against the bearing and then slide the rip fence up against the workpiece. After locking down the fence, you can make your cut (photo at right). Before each additional pass, just repeat the process. Once your workpiece is down to about 1" wide, it's time to start over with a new one.

**Options.** You could rip short pieces with this jig as well. But it is less work to use the other jig since you don't need to reset the rip fence for every cut.

There's one last thing to mention. And that's the "look" of your thin strips. To match your needs perfectly, check out the box below.




# Grain Orientation: Getting it Right

One of the keys to getting the best-looking strips from a workpiece is to make sure the grain direction is "right." What I mean by this is that it's more important to pay attention to the grain along the edge of a board than it is to the grain on the face.

You can see what I mean by checking out the photo. Even though the face of the board features a wavy, "cathedral" grain, the strips ripped from the edge are actually straight-grained. And that may be important if you're edging plywood with a similar grain. Ripping your edging from a riftsawn or quartersawn board will most likely result in "wild" grain which may not be the best look for a project.

# 10 handy drill press Add-Ons

Soup up your drill press with these accessories. They'll add convenience and accuracy to your woodworking tasks.

The drill press in my shop gets a lot of use and it does a great job at the basic task of drilling holes. But I've found a few low-cost accessories that can make using your drill press easier and more accurate.

From clamps and vises to lasers and a replacement chuck, these add-ons can make a big difference in how you use your drill press. Check out the details on these useful accessories on the following pages. You'll find sources for these items on page 51.

# Bit Centering

Whenever you use your drill press to drill a hole, you probably go through a routine. You stoop over, repeatedly lowering the bit and looking at it from side to side, then repositioning the workpiece to make sure you're hitting the mark. But I've found a couple of add-ons that can help you do this faster, easier, and more accurately.

The first is a laser guide system that's easy to install and use. The second is a simple centering pin that makes set up a snap.

**Dual Lasers.** When some manufacturers started to add lasers to their power tool lineup, I thought it was a marketing gimmick. But for some tools, like miter saws, a laser really helps line up the cut.

When it comes to centering a drill bit, though, one laser wouldn't do much to help you zero in on the mark. You really need two lines to form an "X" to mark the centerpoint. It's sort of like looking at the bit from two different angles when lining it up. You can see what I mean in the photos above.

**Easy Installation.** The installation couldn't be easier. The laser system comes in a self-contained unit. You simply use an included clamp to fasten the unit to the top of the drill press column.

**Setup and Calibration.** As you might expect, there's a little bit of work to do to "aim" the two lasers to align with the center of the drill chuck. To make this an easy task, you use the alignment pin you see at the upper right. You install this in the chuck just like a drill bit. A thin, vertical line on the pin serves as the reference point for aligning the two laser light sources.

All you need to do to calibrate each laser is loosen a couple of screws, rotate the laser lens until the beam aligns with the line on the pin, then tighten the screws. Using a test workpiece, you can verify that the two beams cross where the centerpoint of the pin touches. And you won't need to recalibrate it every time you raise or lower the table or work on thicker workpieces.

Once I had the laser unit set up, I was surprised at how quickly I began to rely on it.

**A Simple Option.** But sometimes you don't need a high-tech solution like a laser system. A simple, inexpensive centering pin (shown at left) will do the job.

A centering pin is handy for finding the center of an existing hole. Or when you need to drill into a round object like a dowel, you can use the pin to center a V-block jig. And for locating the center of a hole on metal work, the pin is more precise and easier to use than a drill bit.

**Laser Lights.** *Add-on laser guides take the guesswork out of where your drill bit will land.*

▲ ***Simple Setup.*** *An alignment pin supplied with the laser system aids in setup.*

◀ ***To the Point.*** *A machined pin makes it easy to locate the exact centerpoint for drilling a hole.*

3

► **Go Keyless.** *No more searching for or fumbling with a chuck key with this keyless chuck.*

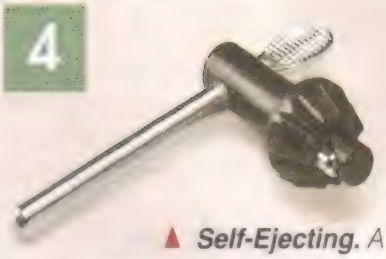
## Chucks & Keys

One of the frustrations with using my drill press is fumbling with the chuck key, losing it, or leaving it in the chuck. Here are a few accessories that can help.

**A Keyless Option.** With a modest investment, you can buy a keyless chuck and throw your chuck key in the junk drawer. A keyless chuck holds bits surprisingly well (photo at left). You simple tighten or loosen the chuck by holding the top knurled collar with one hand and turning the outer sleeve with the other hand. There are a couple of sizes available to fit most drill presses. The included instructions show you to remove your old chuck and install the keyless chuck.

**Key Solutions.** If you're looking for a low-cost upgrade over your old chuck key, there are a couple of options. A self-ejecting key, like the one shown at the upper right can make the difference between safety and injury. A spring-loaded pin ejects it from the chuck when you release it. And the ratchet key shown at right is a great upgrade. Its quick, ratcheting action doesn't take much effort to tighten a chuck.

4



▲ **Self-Ejecting.** *A spring-loaded pin forces the key out of the chuck for improved safety.*

◄ **Quick-Action Rachet.** *This chuck key works just like your socket wrench.*

## Lighting Solutions

Even though my shop is fairly well-lit, I often struggle to see what I'm doing at the drill press. But when I add some task lighting, it makes all the difference.

▼ **Focused.** *A bright LED focuses light exactly where you need it.*

**Bright, Focused Light.** The key to adding task lighting at the drill press is being able to reposition it as needed. The *"Twist Flexlight"* (below left) twists and turns like a snake to focus light exactly where you need it. Its bright LED creates a spotlight for detail work. And the magnetic base holds it securely on the head or cast iron table of your drill press.

**Adjustable Arm.** The familiar "drafting-style" lamp shown at right casts a broader light. It uses a conventional bulb for a light source. The built-in clamp means you can attach it almost anywhere. It's a great option for use on an auxiliary table, like the one shown on page 18.

I have one of these adjustable-arm lamps on my drill press and couldn't work without it. The spring-loaded arms and swivel head make it easy to position the light where I need it. Whichever light you use, you'll find your work is a lot easier on the eyes.

5

6

▲ **Adjustable Arm.** *An inexpensive lamp with an adjustable arm allows you to position light at any angle. It casts a broad light over the work area.*

# Clamps

**Long Reach.** *With its long arm and lever action, this clamp is almost a necessity.*

◄ ***Vertical Hold-down.*** *The vertical post on this hold-down lets you clamp large workpieces securely. A cam lever locks the head in place.*

To use your drill press safely, it's always a good idea to make sure the workpiece is clamped securely. But it's often difficult or awkward trying to position a clamp on the workpiece.

**Go Vertical.** The two clamping options you see here can help you out. The vertical hold-down shown above has a long post with an adjustable head for clamping large or tall workpieces.

**Long Reach.** The locking-lever clamp in the photo above has a long reach. It can overcome the problem of being able to clamp close to the drill chuck where you need the most clamping pressure.

Both of these clamps bolt directly to your drill press table, as shown above. They're good solutions when typical clamps won't do the job. But for precision drilling or metal work, check out the vises below.

# Vises

When basic clamps aren't up to the task, a vise just might be the ticket. Not only do vises hold the workpiece securely, but they can add to the capabilities and accuracy of your drill press.

**Two-Axis Movement.** The unique feature of the vise shown at far right is that it can move a workpiece in two directions. Machinists call this "X-Y" movement. One hand crank moves the jaws left or right, another moves it in or out.

This capability comes in handy for drilling mortises or slots in wood. But it's especially handy for precisely locating a hole when drilling metal.

**Angled Vise.** I never like tilting my drill press table to drill an angled hole. I have to figure out how to clamp the workpiece and I'm never certain of the exact angle. The vise shown at right solves both of these problems. Once the workpiece is secure, just rotate the vise jaws to the proper angle and start drilling.

**X-Y Vise.** *For drilling mortises in wood or holes in metal, this vise can't be beat.*

◄ ***Angles.*** *Instead of tilting the table, you can tilt this vise for angled drilling.*

dream shop project

# woodworking Drill Press Table

## An adjustable fence, versatile clamping options, and a built-in dust collection system make this table a great upgrade.

When I turn to the drill press, it's because I need precisely placed and perfectly straight holes. But the standard, cast iron table won't support anything but the smallest workpiece. Then, trying to clamp a workpiece in place can be a frustrating exercise. And you can forget about dust collection.

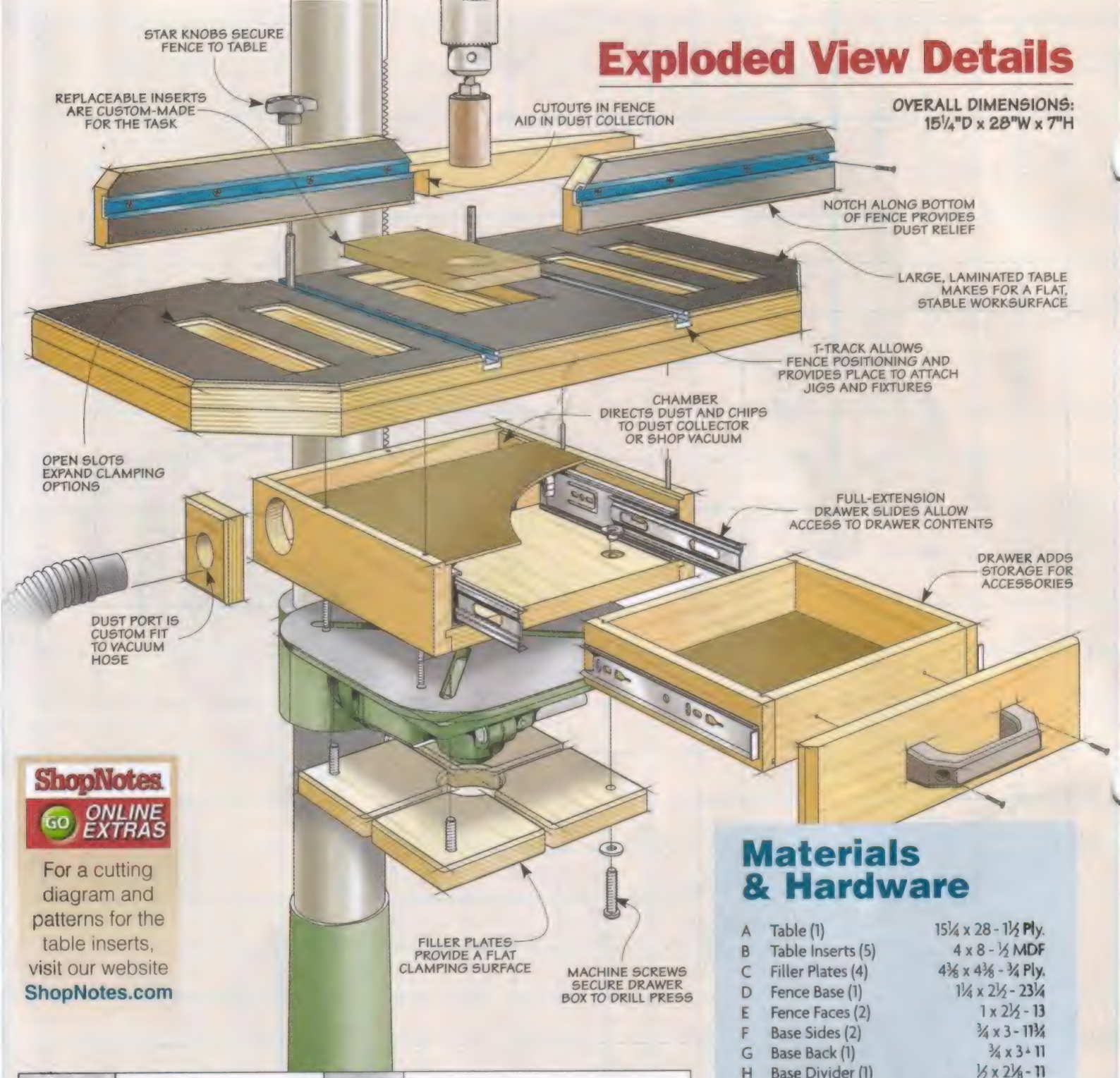
The table and fence system you see here solves all these problems. It turns your drill press into a precision woodworking tool.

One of the best features is dust collection. The fence and inserts work together to funnel most of the dust away through a hidden chute. (This is especially handy when using a drum sander.)

Clamping a workpiece couldn't be easier. You can use the T-track to install hold-downs. And the large, open slots in the table make it easy to reach any size workpiece with a standard bar clamp.

The final touch is a storage drawer. It's just one more reason this project is worth building.

# Exploded View Details




**OVERALL DIMENSIONS:**
**15¼"D x 28"W x 7"H**

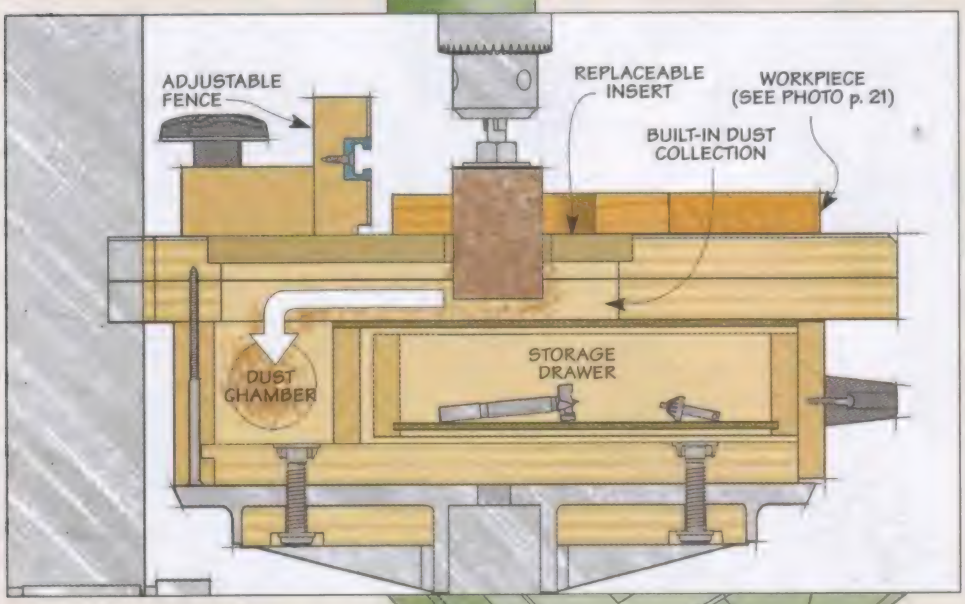
**ShopNotes**
**GO ONLINE EXTRAS**

For a cutting diagram and patterns for the table inserts, visit our website **ShopNotes.com**

## Materials & Hardware

| | | |
|---|---|---|
| A | Table (1) | 15¼ x 28 - 1½ Ply. |
| B | Table Inserts (5) | 4 x 8 - ½ MDF |
| C | Filler Plates (4) | 4⅜ x 4⅜ - ¾ Ply. |
| D | Fence Base (1) | 1¼ x 2½ - 23¼ |
| E | Fence Faces (2) | 1 x 2½ - 13 |
| F | Base Sides (2) | ¾ x 3 - 11¾ |
| G | Base Back (1) | ¾ x 3 - 11 |
| H | Base Divider (1) | ½ x 2⅛ - 11 |
| I | Base Bottom (1) | 11¾ x 11 - ¾ Ply. |
| J | Base Top Panel (1) | 8¾ x 11 - ⅛ Hdbd. |
| K | Base Vacuum Port (1) | 3 x 3 - ¾ Ply. |
| L | Drawer Front/Back (2) | ½ x 1⅞ - 8¾ |
| M | Drawer Sides (2) | ½ x 1⅞ - 8 |
| N | Drawer Bottom (1) | 7¼ x 8¾ - ⅛ Hdbd. |
| O | Drawer False Front (1) | ½ x 2⅜ - 12 |

- (1 pair) 8" Full-Extension Drawer Slides
- (2) Star Knobs w/ 5/16"-18 Threaded Inserts
- (2) 36" T-track
- (1) Utility Pull w/Screws
- (16) #6 x ⅜" Fh Woodscrews
- (4) 5/16" - 18 T-nuts
- (5) #8 x 4" Fh Woodscrews
- (2) 5/16" - 18 x 1½" Flange Bolts
- (4) 5/16" Washers
- (4) 5/16" - 18 x 1½" Ph Machine Screws
- (1) 2' x 4' Plastic Laminate



## packed with
# Features

Adding this multi-purpose table makes your drill press the ideal woodworking platform, and there are a number of reasons why.

First, the large worksurface makes it easy to support a wide range of workpieces. The long slots in the table give you a lot of options for clamping a workpiece, while T-track provides the flexibility to add hold-down clamps and other fixtures. The drawer underneath adds convenient storage (photo at right).

And don't forget the fence. It works in tandem with the table's inserts to provide built-in dust collection. Like the table, a T-track on the fence allows you to attach hold-downs and stop blocks. You can see some of these features in action in the photos below.

**Drawer Storage.** *The small drawer is a convenient place to store a chuck key, drill bits, and other accessories.*

◀ ***Hold-down.*** *A toggle clamp mounted to a small plywood base makes a handy hold-down for small workpieces.*

◀ ***Custom Inserts.*** *Inserts can be made for specialized tasks like drum sanding. They help funnel dust and chips to the dust collection system.*

◀ ***Stop Block.*** *Add a stop block to make drilling repetitive holes or mortises a simple, accurate task.*

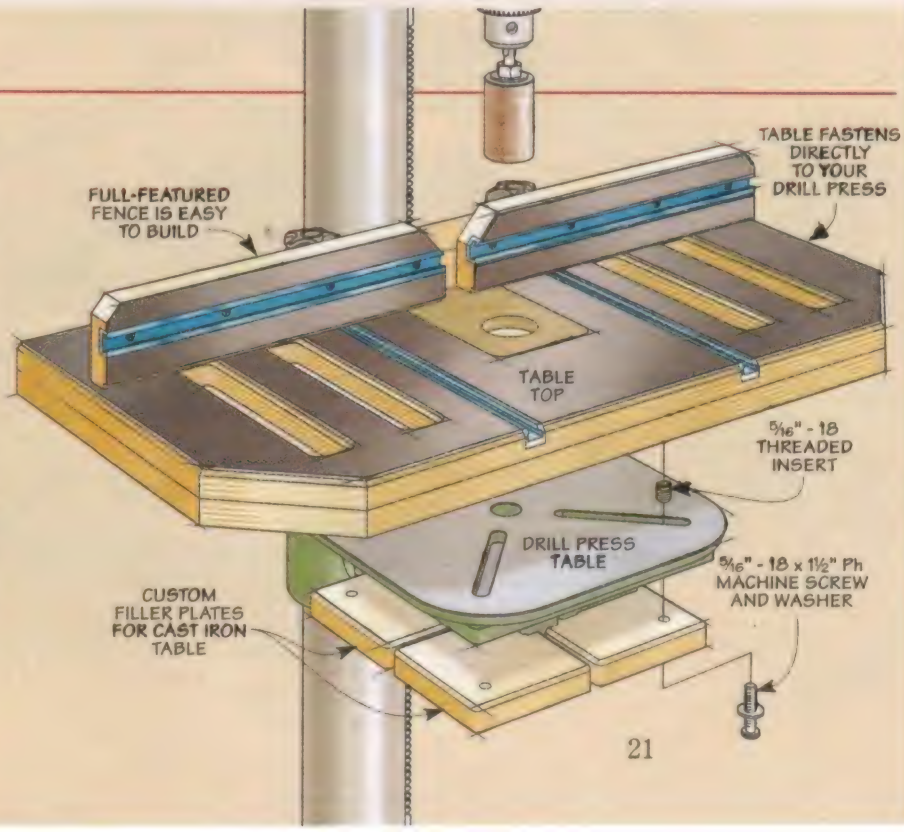
◀ ***Clamping Ease.*** *Slots in the table make it easy to use bar clamps to securely hold the workpiece.*

## Stand-Alone Table

If all you need are a great table and fence system for your drill press, you can build a simpler version without dust collection and storage. You'll still have the most useful features of the fence and table while upgrading your drill press.

If you decide to build just the table and fence system, there are a couple of things to point out. Since you won't be adding the drawer with its dust collection capabilities, there's no need to form the recessed intake area in the fence base.

When mounting the table, you'll still want to make the custom filler plates that fit in the spaces under the cast iron table (drawing at right). They provide a flat clamping surface. You may need to modify the shape of the plates to fit your table. Then it's just a matter of using screws and threaded inserts to attach the table.



# building the Table

▲ ***Inserts.*** *Build custom inserts to suit the task and optimize dust collection. For more information, go online to ShopNotes.com.*

The key to a great drill press table is a large, flat, and stable worksurface. So I chose to use two layers of ¾" Baltic birch plywood with a plastic laminate surface (Figure 1). But instead of gluing up the two layers right off the bat, you'll build it layer by layer (box on the opposite page). Then to finish it off, you'll add two T-tracks and custom inserts. Finally, you'll add the fence.

**Lamination.** You can start by gluing plastic laminate to a plywood blank cut to width and length. This forms the top layer. You'll use it as template to trim the bottom layer to final size later on.

What's great about this process is you can cut out the slots (using a template), cut the front corners, and form the back notch on just one layer of plywood. A pattern bit in your router takes care of finishing up the bottom layer.

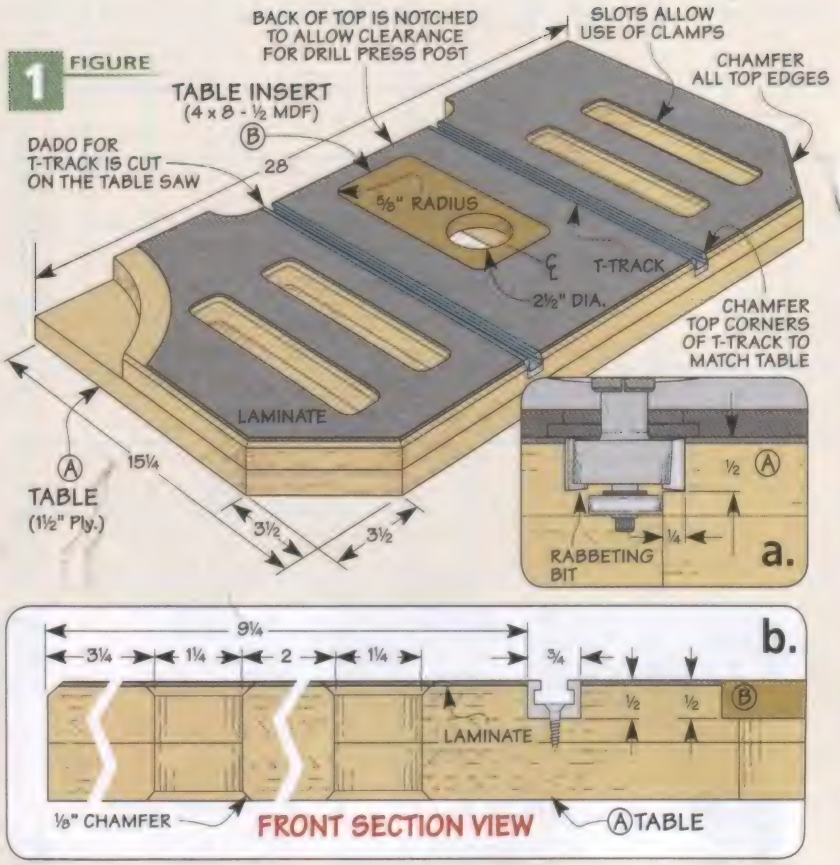
**Chamfers.** With the top glued up, go ahead and rout chamfers on all the top edges (including the open slots) and the bottom edges of the slots, as shown in Figure 1b.

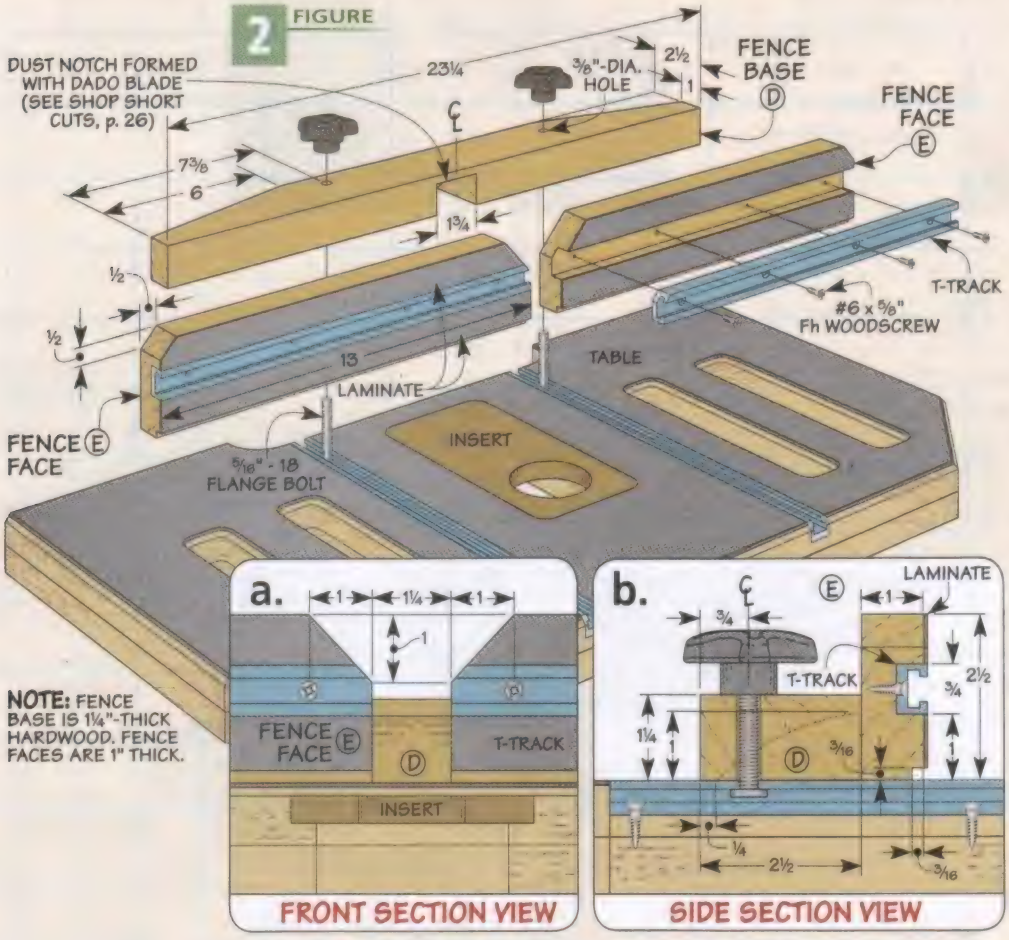
**T-Track.** The next thing to do is cut the two dadoes for the T-track. T-track is a handy accessory to have in the shop for all sorts of tasks. And this drill press table is no exception. Not only does it make repositioning the fence a snap, but it works great for custom clamping and hold-down devices.

To cut the two dadoes, I used a ¾"-wide dado blade in the table saw. Then it's just a matter of cutting the T-track to length and screwing the two pieces in place.

**Insert Opening.** A great feature of the table is the interchangeable inserts. You can make custom inserts suited to the task, as shown in the margin photos at left. Openings in the inserts allow dust and chips to be picked up by the dust collection system. And when the insert becomes damaged or worn, just pop in a new one.

You already cut the rough opening for the insert when you glued the table together. Now you just need to rout the rabbet that forms a ledge for the inserts. You can see the details for this in Figure 1a. Since I used ½" MDF for the inserts,



I made the rabbet ½" deep and ¼" wide using a rabbeting bit.

## ADJUSTABLE FENCE

Now that the table top is complete, you can work on the fence. As you can see in Figure 2, two fixed faces are attached to a hardwood base. Plastic laminate and T-track complete the faces, while a notch in the fence base directs dust and chips to the vacuum chamber underneath.

**Fence Base.** I started with the base, choosing straight-grained hardwood for stability. With that in hand, take some time to joint and plane it straight, ensuring that the faces are square to the bottom.

**Dust Notch.** If you look at Figure 2b, you can see the arched cutout in the fence base I mentioned earlier. The trick to cutting this notch is to use a dado blade in the table saw. To see how I did this, turn to Shop Short Cuts on page 27. (You can skip this step if you don't want to add the drawer.)

**Faces.** The two faces for the fence are also made from hardwood. After cutting the pieces to size and beveling the corners, you can glue plastic laminate to the faces and trim it flush with a pattern bit at your router table. With that done, go ahead and switch out the pattern bit for a chamfering bit and ease the edges.

There are a couple of things left to do before you can glue the faces to the base. The first thing is to cut a dust relief notch on the lower front edge of each face (Figure 2b). This helps keep dust and chips from holding the workpiece away from the fence when drilling.

Next, you can cut the dadoes for the T-track and install it. And the last step is to glue the faces to the fence base so their bottom edges are flush and square with the bottom of the base.

**Drawer Option.** Now is the time to make a decision. If you're going to build the drawer unit, turn to the next page. Otherwise, you can mount the table to your drill press, as shown on page 21.

# Building the Table: Step by Step

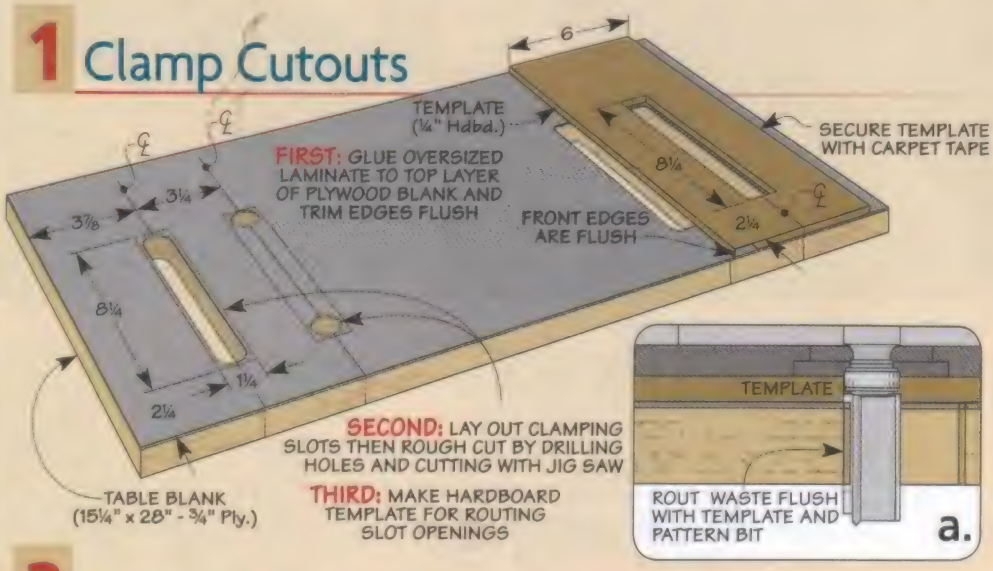
Building the table for the drill press is a lot like making a layer cake — except you start with the top layer.

First, cut a plywood blank for the top layer to size and glue an oversized piece of plastic laminate to the top (Step 1).

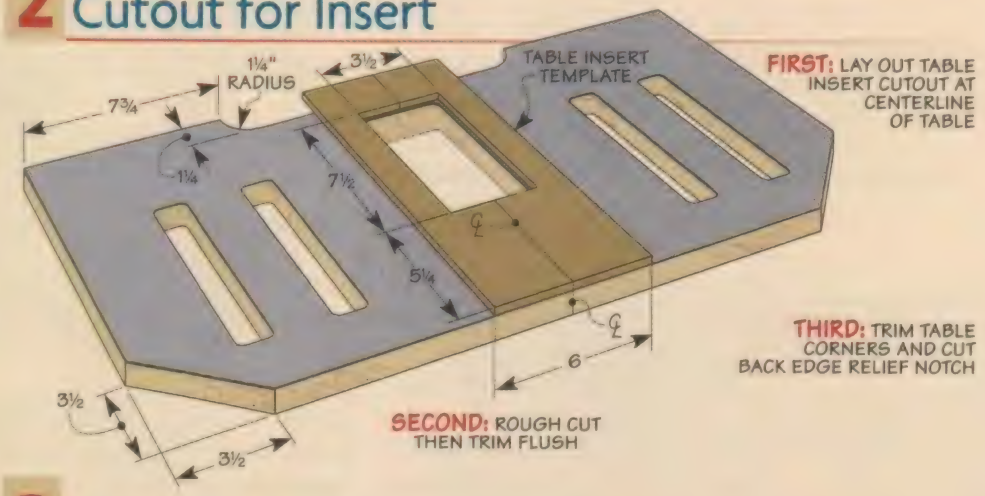
After laying out the openings, you'll create hardboard templates to cut and rout them. To cut out the openings, you can drill starter holes then use a jig saw to rough out the waste. Now just use the templates to trim everything smooth with a router (Steps 1 and 2).

With the top layer complete, use it to mark the openings on the bottom layer then rough them out as before. Finally, glue the layers together and use the top layer to trim everything smooth (Step 3).

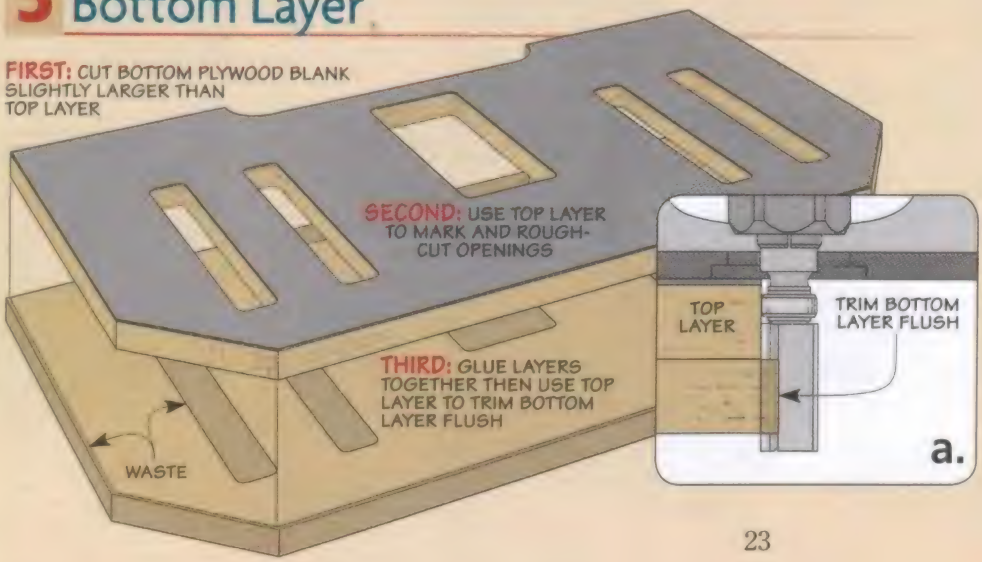
## 1 Clamp Cutouts




## 2 Cutout for Insert




## 3 Bottom Layer



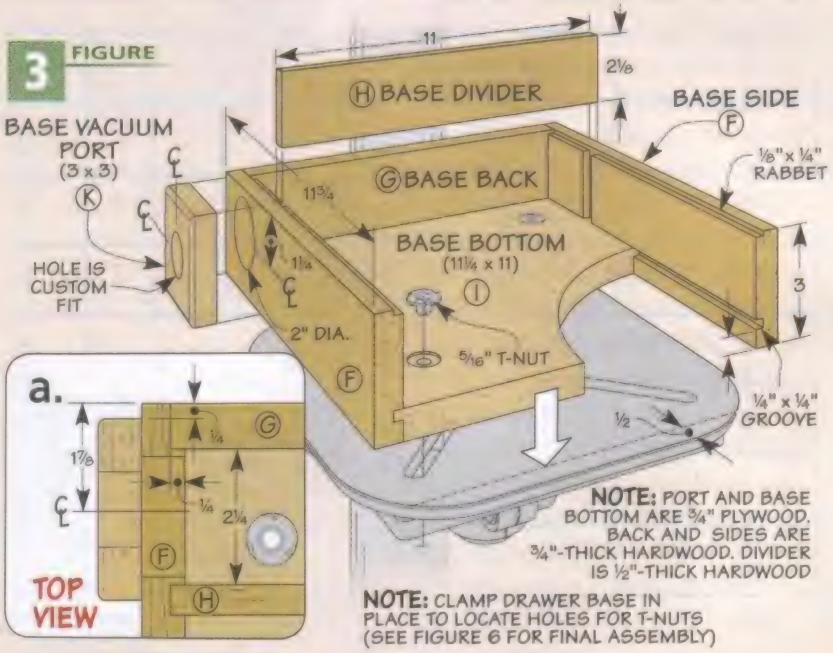
**Built-In Dust Collection.** *A hidden dust collection chamber and a custom-fit vacuum port pulls the dust and chips out of your way.*

## adding storage with the

# Base & Drawer

One of the features I like about this drill press table is the dust collection system. It's a simple design, but very effective. The secret is a hidden chamber in the back of the base. A divider forms a dust chute that funnels dust and chips to a vacuum port on the side of the base, as shown in Figure 3.

And the base makes a sturdy platform for mounting the table. T-nuts and screws secure it to your drill press. Then, long woodscrews pass through the sides and back of the base to secure the table.



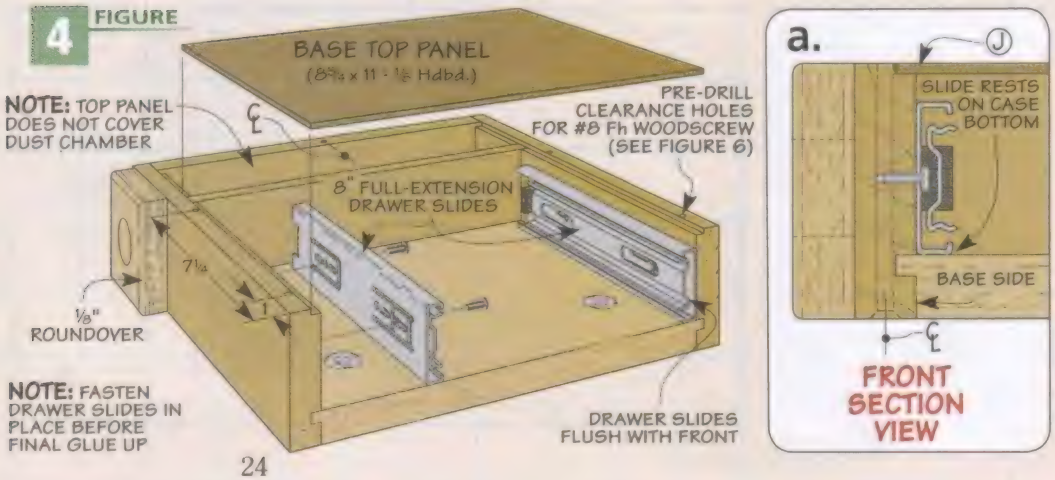

Another useful feature I like is the storage drawer. The full-extension drawer slides make it easy to access all of the drawer's contents. Hardwood construction and simple joinery make it easy to build. But the first thing to do is start on the drawer base.

## DRAWER BASE

In Figure 3 above, you can see how the drawer base is put together. I started with the bottom panel and built the sides and divider to fit.

**Bottom Panel.** All you need to do after cutting the bottom panel to size is rabbet three sides to form the tongues. These will fit into the grooves in the side and back pieces you'll make next.

**3-Sided Box.** Figures 3 and 4 will help you make all the cuts for the sides and back. The back fits



into rabbets and the divider will fit in dadoes in the side pieces.

You'll notice that there's a shallow rabbet along the inside top edge of the side pieces for the base "dust cover" panel (Figure 4a). It keeps dust from getting into the drawer and helps direct the debris to the dust chute for collection.

**Dust Port.** And speaking of dust collection, now is the time to drill the hole in one of the sides of the base for a vacuum port (Figure 3). Then you can make a custom port to match your dust collector hose.

**Mounting Holes.** In Figure 4, you'll see holes drilled vertically through the back and side pieces. Long screws pass through these holes to fasten the table in place.

**Cut to Fit.** Next, you can dry-fit and clamp the side and back pieces in place and measure for the length of the divider. There's one thing to note about the divider. When you cut it to final width, it should sit flush with the bottom of the rabbet along the top edge of the sides. This will accomodate the ⅛"-thick top panel of the base.

**Drawer Slides.** Since the drawer box is so narrow, it's easier to install the drawer slides before you glue the sides to the bottom panel. Then you can glue everything together for the base.

**Filler Plates.** Before you mount the base, you'll need to make custom filler plates to fit the bottom of your drill press table. They fill in between the ribs and form a flat clamping surface.

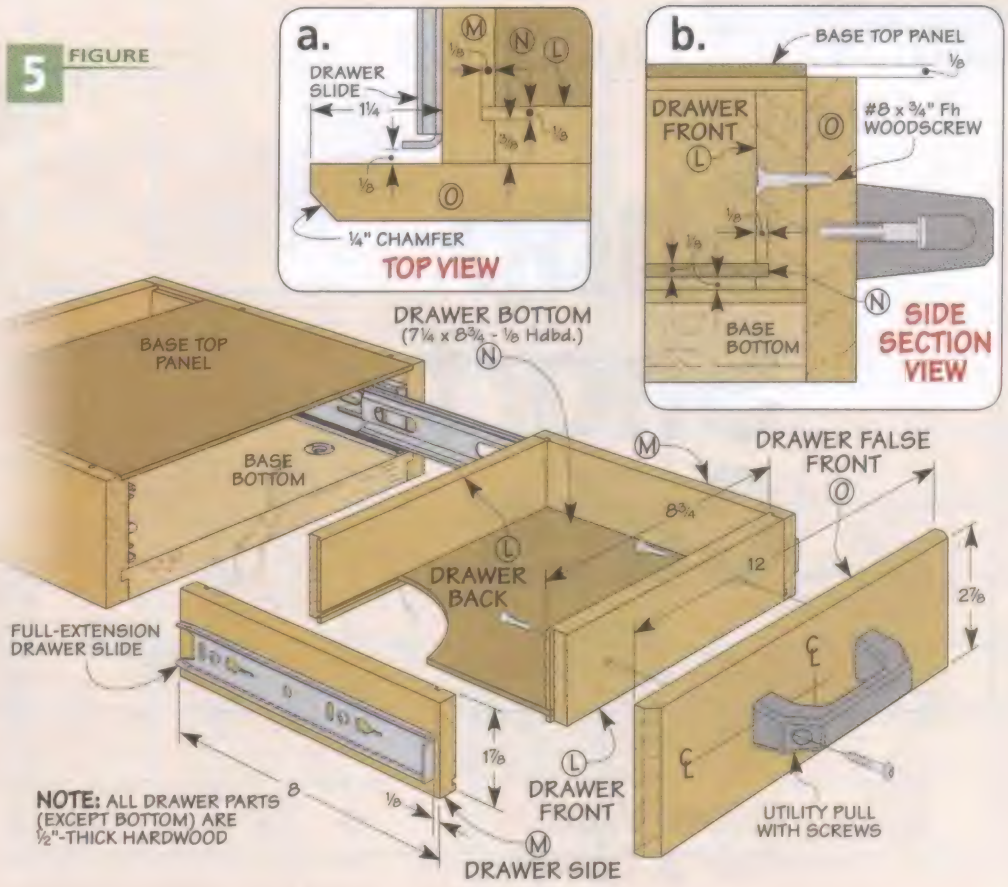
**Attach the Top.** With the filler plates made, you can attach the table to the base, then mount the entire assembly to your drill press. Figure 6 at right shows you how it all goes together.

## DRAWER

With the base and table mounted on your drill press, it's time to work on building the drawer, as shown in Figure 5.

The front and back of the drawer have tongues on the ends to fit dadoes in the drawer sides.

FIGURE 5

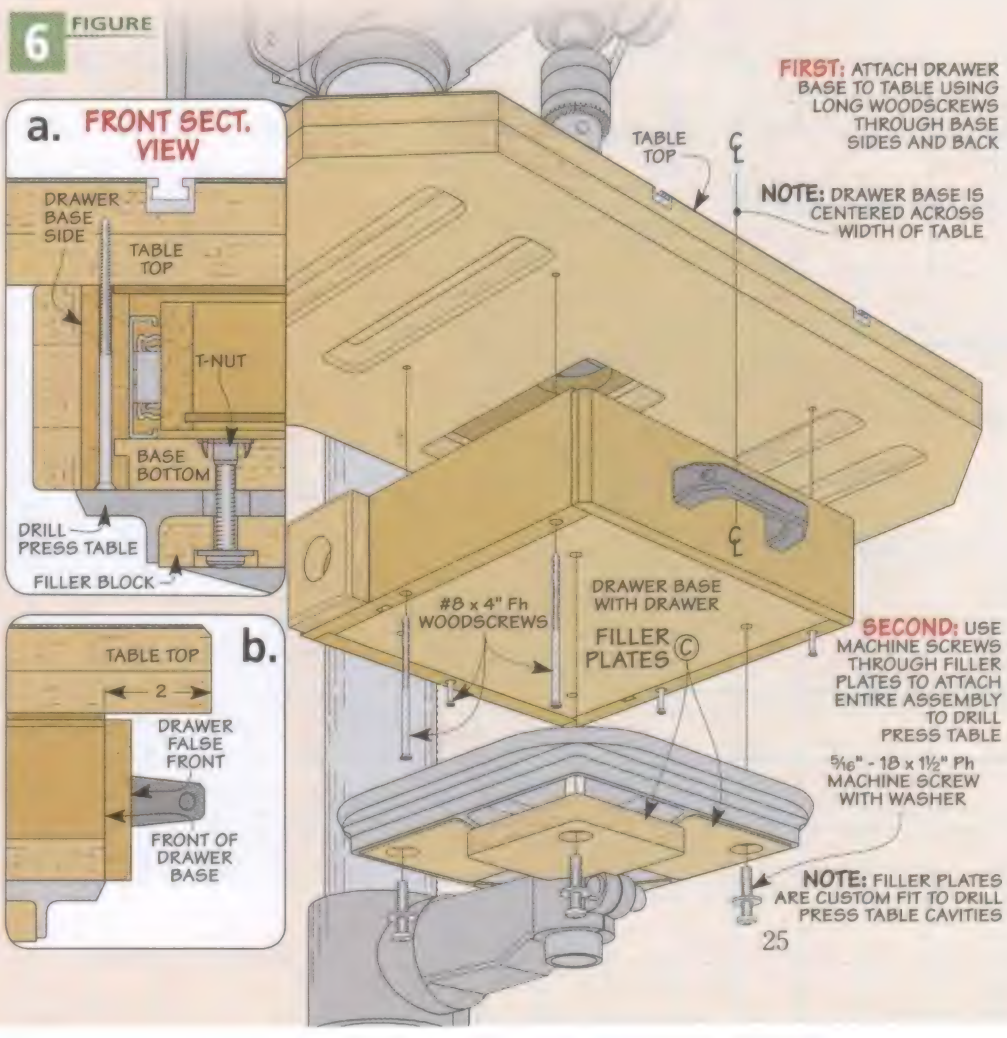



A groove along the bottom edge of all four pieces holds the bottom.

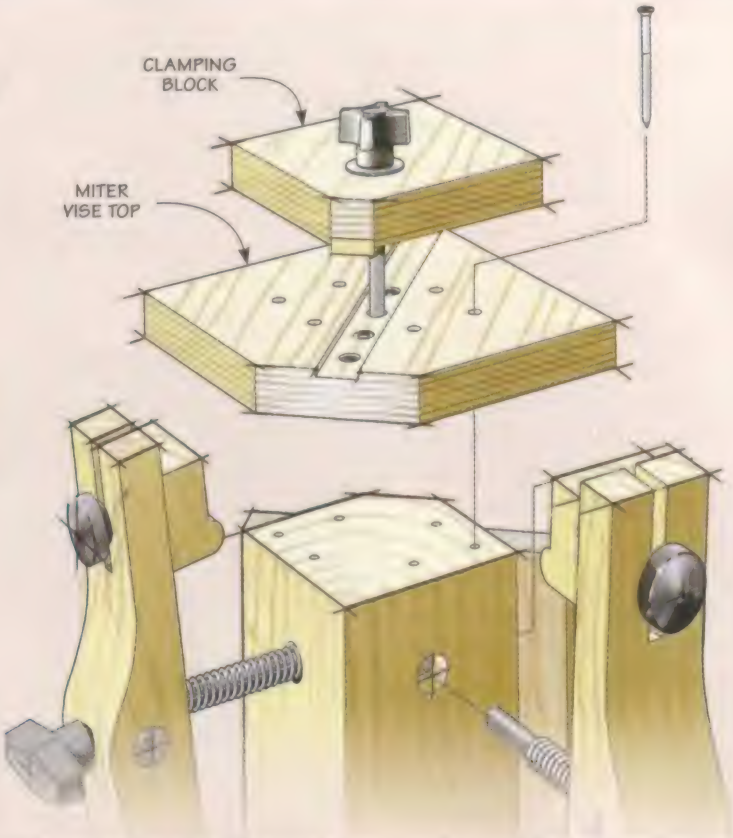
After mounting the drawer slides, I cut the false front to size, allowing ⅛" clearance at the top (Figure 5b). You can bevel the ends using your table saw. Finally, fasten the false front to the drawer.

All that's left to do is hook up your dust collector. Now you're ready to put the table to the test on your next project.

FIGURE 6



# Shop Short Cuts




## Miter Vise Top & Block

One of the keys to a creating a tight miter joint with the vise shown on page 36 is starting with a 90° reference corner at the top of the vise. What's critical here is that the vise top and clamping block that make up the corner align with each other.

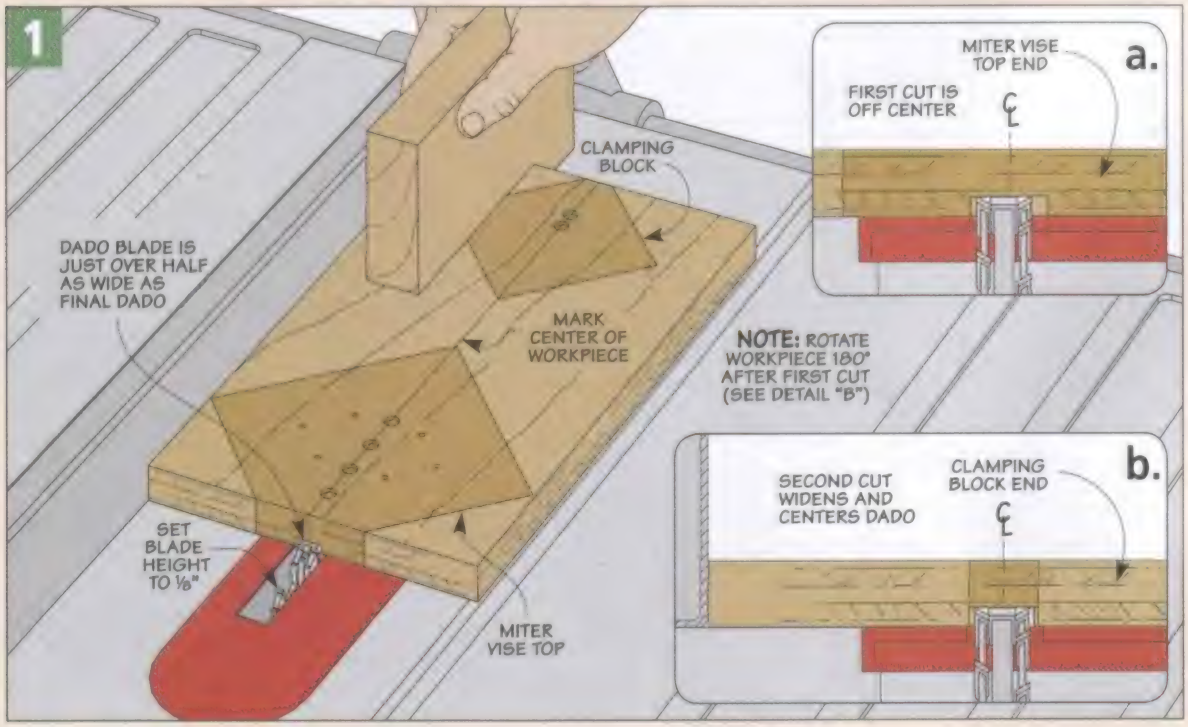
**Centered Dado.** The first step to accomplish this is to cut a centered dado in an oversized blank, as shown in Figure 1. But the key is not to try to cut it to the exact size and center it in one step. Instead, set up your dado blade so it's a little more than half as wide as the final width of the dado.

Once that's complete, you can make a first pass, which is slightly off-center (Figure 1a). Then just flip the workpiece around and make another pass, as in Figure 1b. This two-step process results in a perfectly centered dado.

If the dado isn't the correct width, simply reset the rip fence and repeat the process by making two more passes, sneaking up on the desired width.

**Alignment Holes.** Before you cut the top and clamping block from the blank, step over to the drill press. There you can drill the holes used to adjust and lock the two pieces together. Doing this now ensures that the holes in the two parts line up with each other.

Finally, head back to your table saw and cut the parts free, taking care to keep the corners at 90°.



## Stop Block & Hold-Down

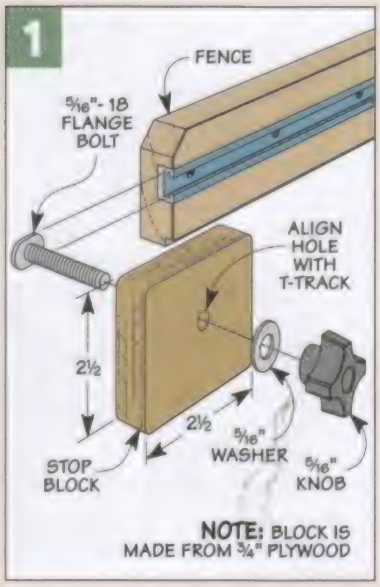
While the table and fence on page 18 are a great addition to any drill press, you can make them even more useful with a couple of handy accessories — a stop block and an adjustable hold-down. Note: You can use these accessories on any table or fence with T-track.

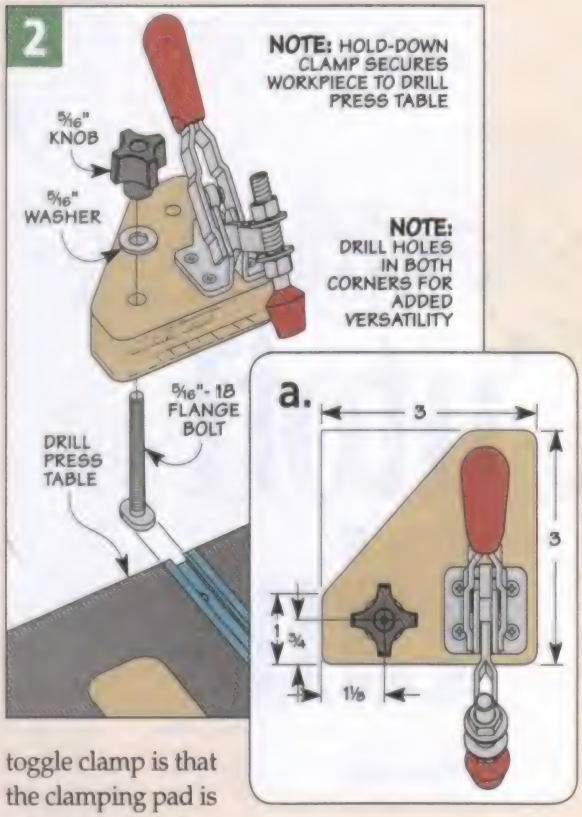
The stop block makes it easy to drill a hole in the same location on any number of workpieces. And the adjustable hold-down can be placed anywhere along the T-track to secure a workpiece with the quick-action toggle clamp.

**Stop Block.** The best thing about the stop block is its simplicity. It's just a piece of ¾" plywood with a hole drilled in it. A flange bolt, washer, and knob secure it in place (Figure 1). And rounded corners provide dust relief.

**Hold-Down.** The details for building the hold-down are shown in Figure 2. Like the stop block, it mounts to the T-track in the table with a flange bolt, washer, and knob. To minimize its profile, I trimmed it to a triangular shape and then sanded all the corners smooth (Figure 2a).

All that's left to complete the hold-down is to add the toggle clamp. The nice thing about the toggle clamp is that the clamping pad is adjustable. This feature allows you to securely clamp workpieces of varying thicknesses to the drill press table.



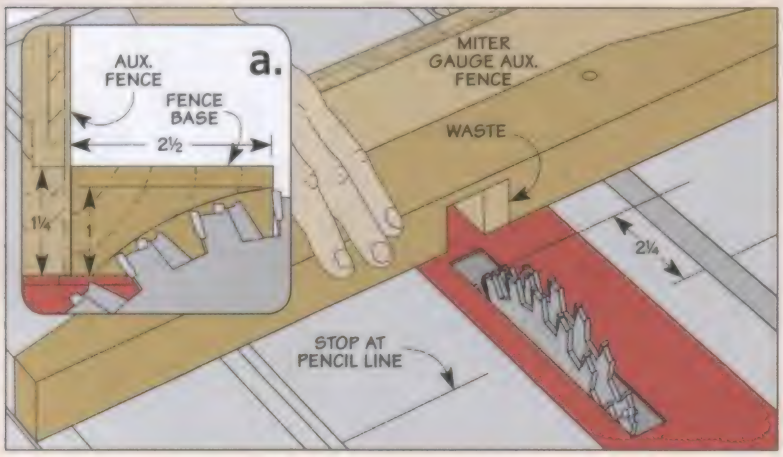




## Dust Collection Notch

For the dust collection system of the drill press table to work properly, the base of the fence requires a "dust port." This port is just a notch cut at the table saw, as you can see in the drawing below.

To create this notch, I installed a wide dado blade and raised it to a height of 1". Note: The dimensions listed are for an 8"-dia. dado blade. Since the notch is not a through cut, the next step is to draw a line on the top of your table saw to indicate where to stop the fence base for each cut as you widen the notch. I located my layout line 2¼" back from the leading edge of the dado blade, as you can see in the drawing below.

Once you have the layout line located, all that's left to do is cut the notch. For better support, I added an auxiliary fence to my miter gauge (drawing below).




# Drill Press Table: Installation

▲ ***Positioning the Table.*** *To ensure the drill press table is positioned properly for the sanding drum inserts, use a blank insert with the centerpoint of the hole located. Then just bolt the table in place.*

weekend workshop

# stacking Cutoff Bins

## This project blends plenty of storage and organization in a three-piece, stackable unit.

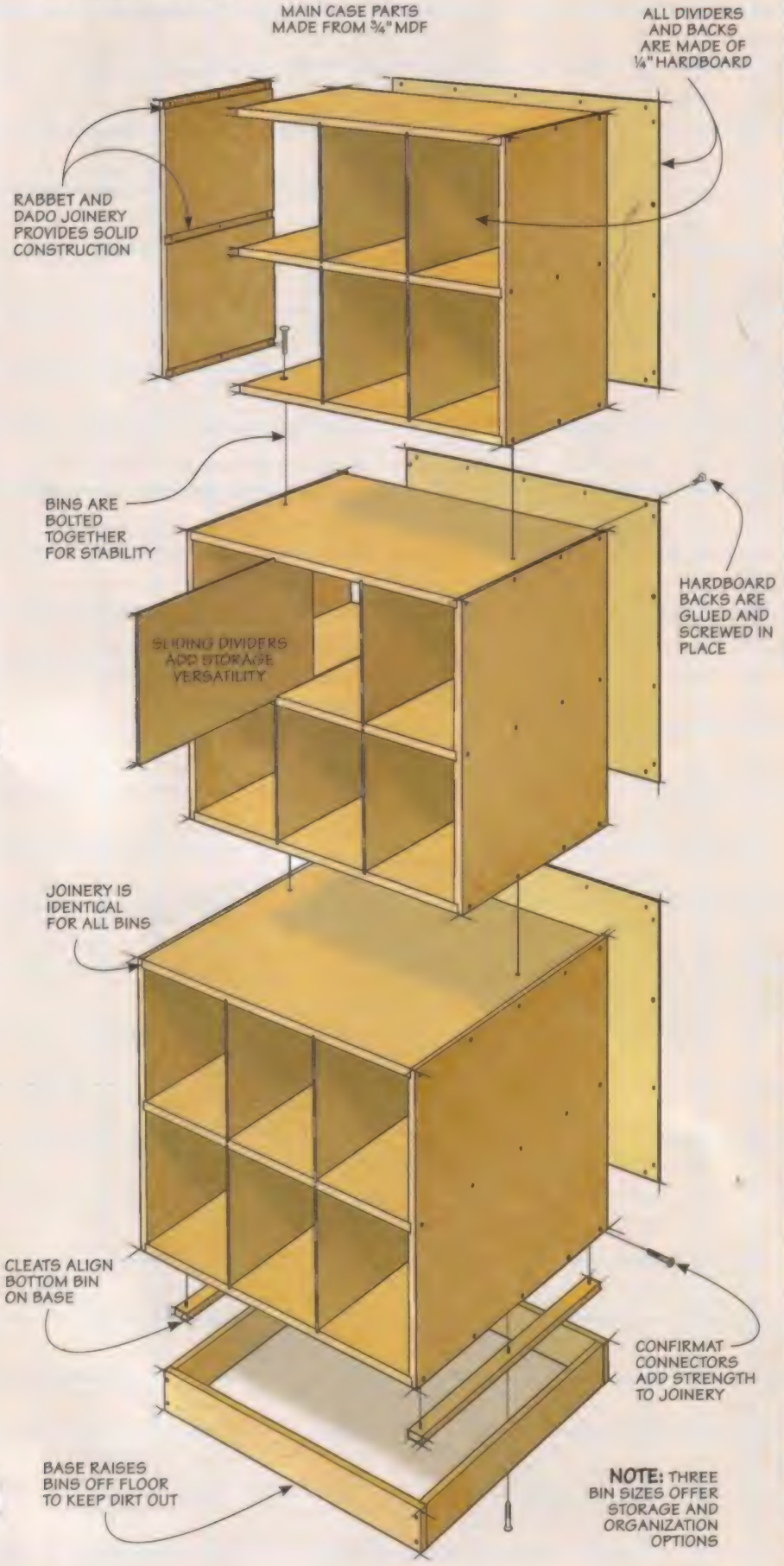
For a long time, my "system" for storing short pieces of wood was simple — squirrel it away in every nook and cranny I could find. The problem with this arrangement was lack of organization. I didn't always know what I had on hand. So, to tackle this problem, I built the cutoff bins pictured here.

As you can see, there's plenty of storage. But just as important, it works as a built-in sorting system. You can arrange cutoffs by size and species, knowing at a glance exactly what you have. (Alternative designs to suit any woodworking shop are shown on page 30.)

The construction is pretty straightforward. Although there are three different-size bins, the joinery is identical and can be easily cut on your table saw. And the individual bins bolt together to give the entire unit more stability.

# Exploded View Details

**OVERALL DIMENSIONS:**
**31"D x 32¾"W x 79¼"H**




# Materials & Hardware

| | | |
|---|---|---|
| **UPPER CASE** | | |
| A | Sides (2) | 16½ x 25¼ - ¾ MDF |
| B | Top/Shelf/Btm. (3) | 16¼ x 31¾ - ¾ MDF |
| C | Dividers (4) | 16¼ x 12 - ¼ Hdbd. |
| D | Back (3) | 32¼ x 25¼ - ¼ Hdbd. |
| **MIDDLE CASE** | | |
| E | Sides (2) | 23¾ x 25¼ - ¾ MDF |
| F | Top/Shelf/Btm. (3) | 23½ x 31¾ - ¾ MDF |
| G | Dividers (4) | 23½ x 12 - ¼ Hdbd. |
| **LOWER CASE** | | |
| H | Sides (2) | 31 x 25¼ - ¾ MDF |
| I | Top/Shelf/Btm. (3) | 30¾ x 31¾ - ¾ MDF |
| J | Dividers (4) | 30¾ x 12 - ¼ Hdbd. |
| **BASE** | | |
| K | Base Front/Back (2) | ¾ x 3½ - 31 |
| L | Base Sides (2) | ¾ x 3½ - 28 |
| M | Cleats (2) | ¾ x 1½ - 27½ |

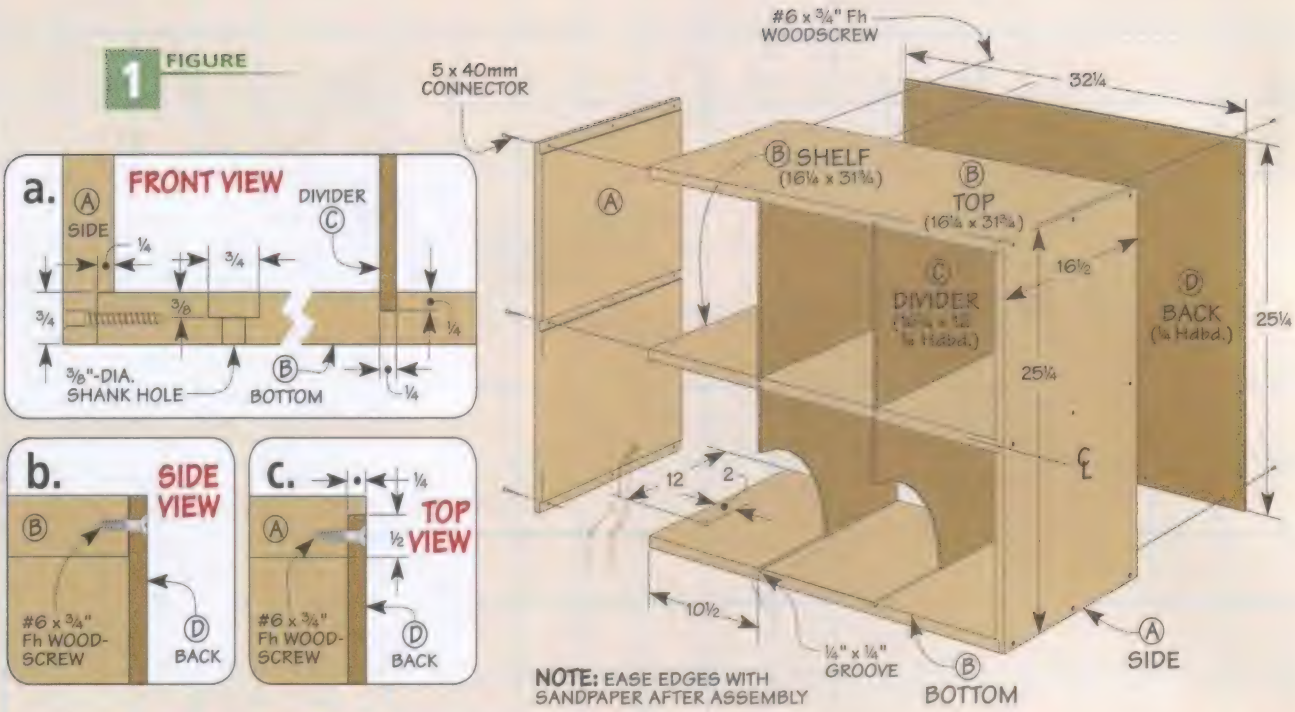
- (72) 5 x 40mm Connecting Screws
- (4) 5/16" - 18 x 1" Carriage Bolts
- (4) 5/16" - 18 Washers
- (4) 5/16" - 18 Nuts
- (6) #8 x 1¼" Fh Woodscrews
- (54) #6 x ¾" Fh Woodscrews

ShopNotes GO ONLINE EXTRAS

To download a free cutting diagram for the Cutoff Bins, go to: www.ShopNotes.com

▲ ***Stack On Edge.*** *Sorting the cutoffs by type and setting them on edge make it easy to find the right workpiece for your project.*

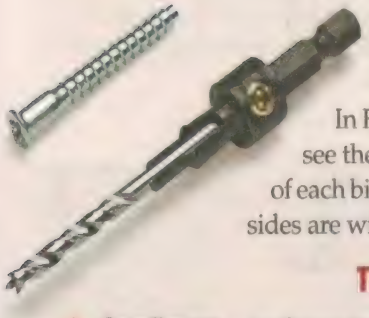
FIGURE 1




# building the Bins

There's nothing complicated about building these storage bins. Each bin is simply a box made from inexpensive MDF and hardboard, and assembled with dado and rabbet joinery. Once you've set up your table saw for one type of cut, you can make all the corresponding cuts at the same time.

**The Cases.** The first step is to cut the MDF parts to size. In Figures 1 and 2, you can see the top, bottom, and shelf of each bin are the same size. The sides are wider to hide the back.



▲ ***Confirmat Screws.*** *These screws are perfect for assembling MDF projects. The countersink bit helps the thin screwhead sit flush with the worksurface.*

## THE JOINERY

At this point, you're ready to tackle the joinery. I like to use rabbet and dado joinery for this type of project because it's simple to cut and it's strong. And the joinery for the bins is basically the same.

**Rabbets.** I decided to start with the rabbets in the case sides. An auxiliary fence and a dado blade help this task go fairly quickly.

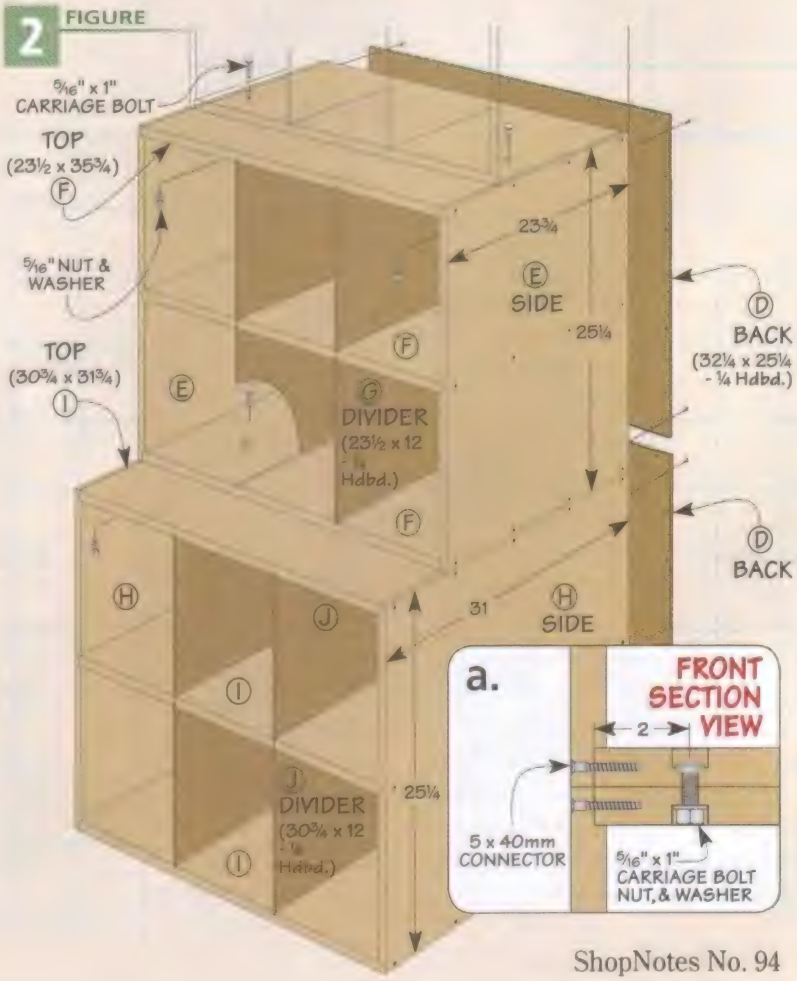
Once that's done, you can adjust the auxiliary fence to cut rabbets along the back edges of the sides. These rabbets will hold the hardboard backs. Not only do the backs add rigidity, but they keep the cutoffs from falling out the back of the bins (Figures 1b and 1c). You'll install the backs later.

**Centered Dadoes.** After the rabbets are cut, all you have to do is adjust the fence to cut the centered dadoes for the shelves. Since the sides of all three bins are the same height, the centered dadoes will be in the same place in each side.

**Divider Joinery.** With the case joinery complete, you can now turn your attention to the joinery for the dividers. To create the storage bays in each bin, the dividers slip into dadoes cut into the tops, bottoms, and shelves (Figure 1a). Here again, once you have the fence adjusted and the dado blade set, you can cut them all at the same time.

**Bolt Holes.** With all the rabbets and dadoes complete, you're just

FIGURE 2



about ready for assembly. But there's one last thing to do. While these bins can simply be stacked on top of each other, bolting them together will make the stack more stable (Figure 2). Figure 2a shows where to drill the holes and install the connecting hardware.

## ASSEMBLY

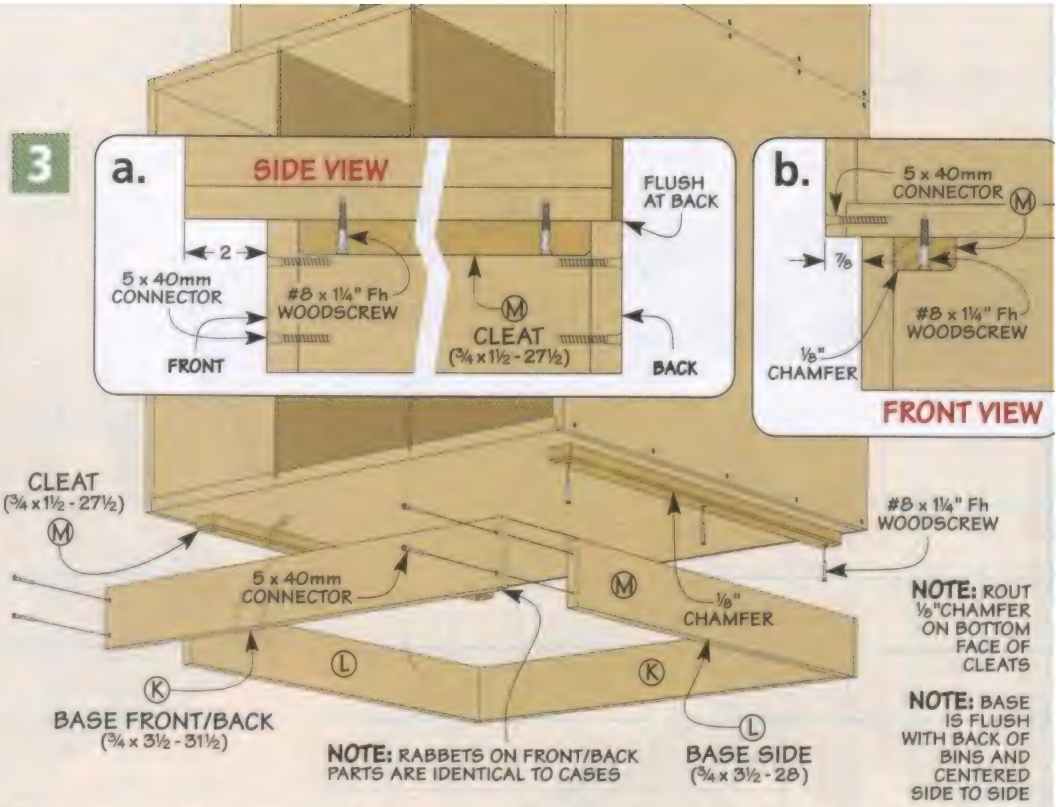
Now, you can start assembling the bins. Figure 1 shows how they go together. I used glue and screws for strength. For MDF projects, I've found the *Confirmat* screws you see pictured in the far left margin are the best to use.

**Dividers & Back.** After the main case parts are assembled, you can cut the dividers and backs to size (Figure 1). By waiting until the cases were assembled, you can "sneak up" on a good fit. Then simply slide the dividers into place and glue and screw on the backs.

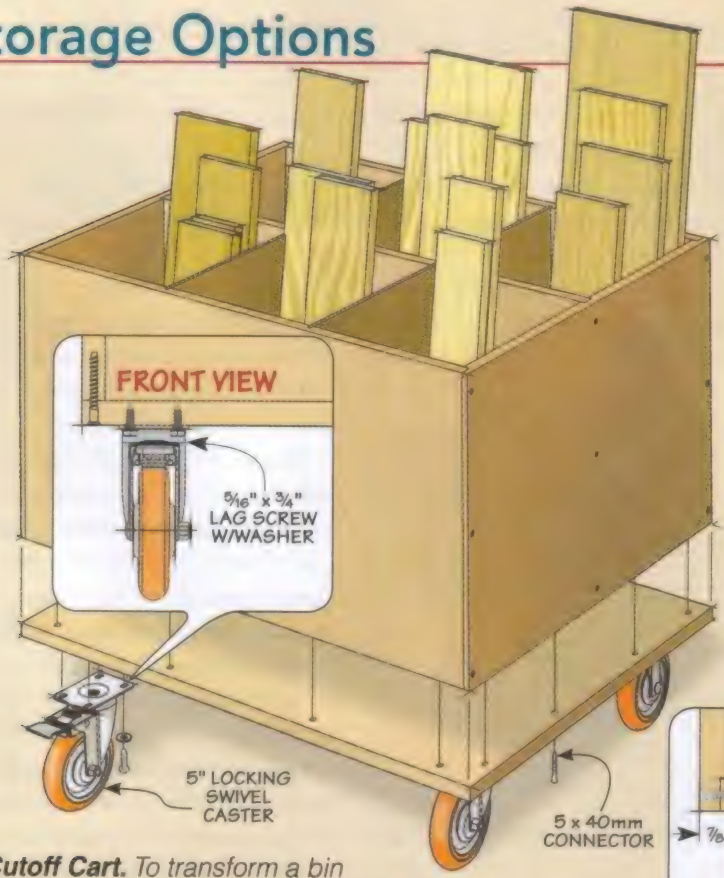
**The Base.** Before you stack and bolt the bins together, there are a couple more steps to complete. First, to soften the edges, I sanded the front edges of the bins.

Second, to raise the bottom bin up off my shop floor (and make it easier to sweep around), I made a simple base (Figure 3). The sides of the base fit into rabbets in the front and back, then screwed together. Rather than attach the base directly to the lower bin, I used cleats to the bin to keep it aligned.

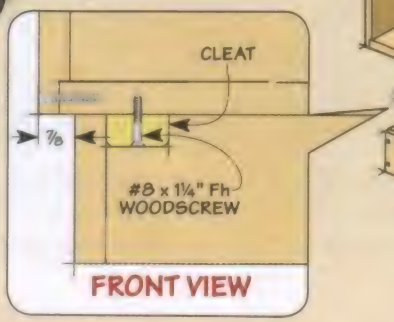
All that's left to do at this point is to round up your cutoffs and sort them out. I'm sure you'll use more of the material you have on hand, instead of just collecting more scraps.

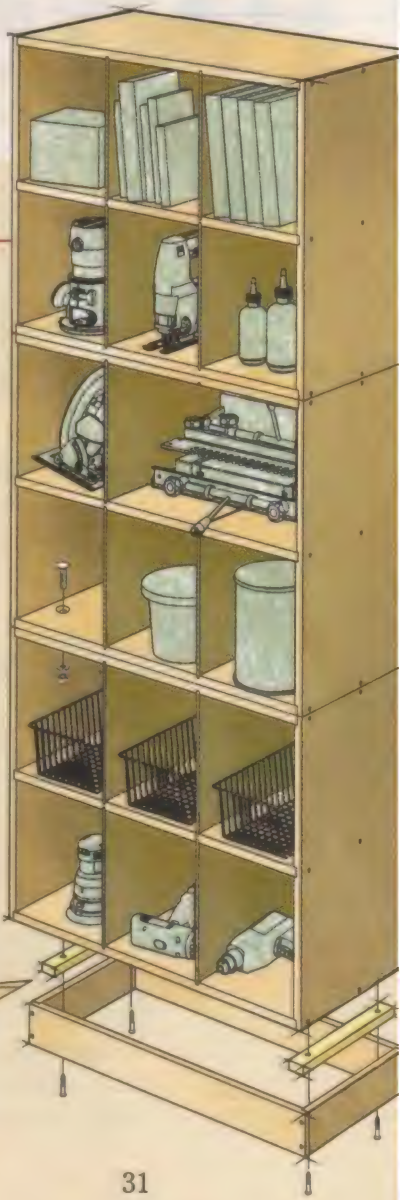



## Storage Options




▲ ***Cutoff Cart.*** *To transform a bin into a roll-around cart, flip it on its back and install a thicker base and casters.*



► ***Storage Tower.*** *To create a smaller footprint, build and stack several small bins to store tools and other items.*

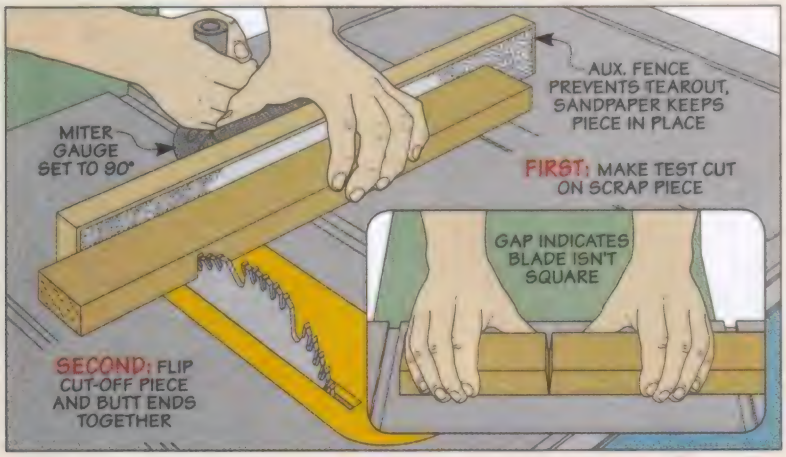
HANDS-ON Technique

# top 10 tips for Perfect Miters

From start to finish, these simple tips and techniques will keep you on the right track for accurate cuts.

If there's one joint that really gives a woodworker headaches, it's the miter. Part of the frustration is that at first glance, a miter seems so simple. Cut a 45° angle on each end of two boards and glue it together — no problem, right? And one miter joint is pretty straightforward. But, if you've ever made a mitered frame, you know that cutting eight miters and fitting them together without a gap is the real challenge.

However, you don't have to settle for less-than-perfect results. All it takes is getting a handle on the whole process (set up, cutting, assembly), and paying attention to the details. This way, you can expect top-notch results every time.




▲ ***Square the Blade.*** *After setting the blade parallel to the miter gauge slots, make a test cut to check if the blade is square to the table. If you find a gap in the test pieces, you'll need to adjust the 90°-stop on the saw.*

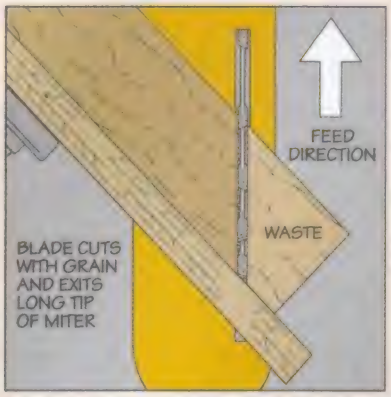
## SETTING UP THE SAW

Although it's tempting to just start cutting, the process begins even before you turn on your table saw. Let's start with a couple of basic saw adjustments.

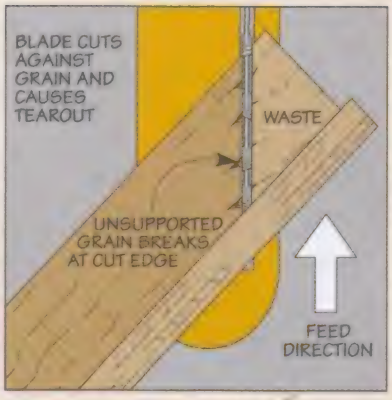
**Blade Alignment.** No matter what kind of cuts you're making on the table saw, you're going to get better results if the blade is perfectly parallel to the miter gauge slots. Any inconsistency will lead to a burned or ragged cut.

Even if you've taken care of this step before, it's a good idea to check it periodically. Consult with your owner's manual for the procedure to make any adjustments.

**Square the Blade.** There's one other blade setting to take a look at. And this one is easy to overlook.




▲ ***Facing the Blade.*** *Tilt the miter gauge toward the blade to cut with the grain.*




▲ ***Away from the Blade.*** *Rotated the other way, the grain can tear out along the face of the miter.*

And that's whether the blade is square to the saw's table.

One thing I've learned over the years is not to trust the blade tilt gauge on my saw. Instead, I use a simple test to make sure it's dead on. The bottom drawing on the previous page is your guide. Just be sure to make only small adjustments to the 90° stop at a time. Then check it again with another test cut. Once the joint is tight, you'll know the setting is perfect.

**Miter Gauge Setup.** While you're cutting your test pieces, do you notice any play in the fit of the miter gauge in the slot? If things are a little bit sloppy, take a look at the margin drawing at the right for a quick and easy fix.

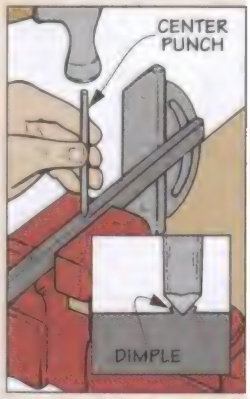
In the photo on the opposite page, you can see an upgrade I've made to the miter gauge. I attached an auxiliary fence to the face. This simple add-on gives me more control over a workpiece *and* backs up the workpiece to prevent tearout as you complete the cut.

On the face of the fence, I added a strip of self-adhesive sandpaper (150-grit). This helps hold the workpiece in place and prevents it from "creeping" during a cut.

**Setting the Angle.** With the miter gauge working smoothly, you can now adjust the head for a 45° cut. But which way should you rotate it? I tend to get smoother, cleaner cuts when the miter gauge is "facing" the blade. If you look at the two drawings to the left, you can see the reason why.

Now that you know which way to rotate the miter gauge, you need to be certain it's set accurately. What I like to do is set the angle using the head of a combination square. And you can read more about that, along with a couple of other options in the box below.

**Next, Making the Cut.** From here, you can get to work cutting the workpieces. For more on this technique, just turn the page.




▲ ***Raised Dimples.*** *To take up the play in the miter gauge, strike the side of the bar with a center punch.*

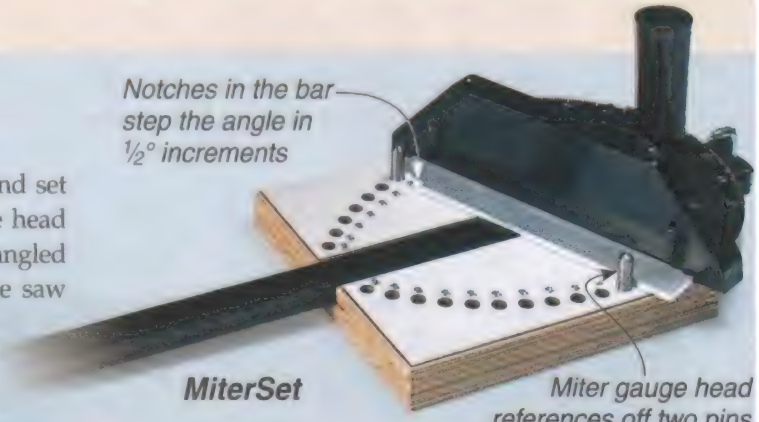
# easy setup: Miter Guides

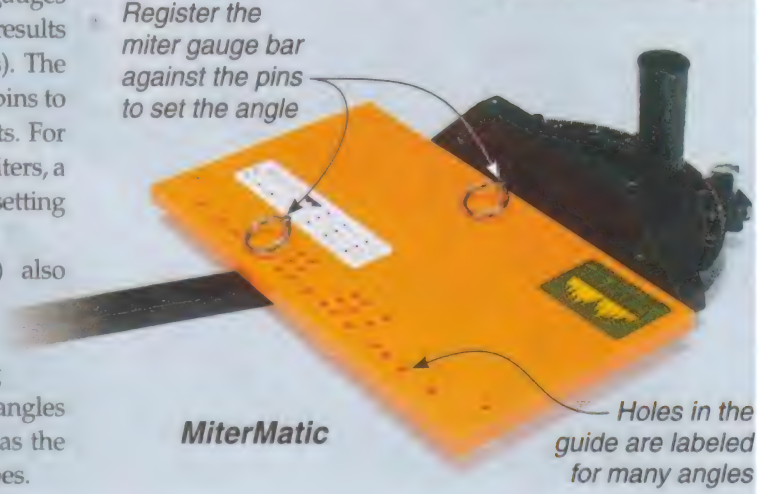
The miter gauge that comes with most saws is pretty basic. And like the blade tilt gauge on the saw, I don't trust the angle scale on the miter gauge. Instead, for perfect 45° miters, I use the head of my combination square to set the angle (photo below). All you need to do is loosen the miter gauge and set the long edge of the square head against it. Then place the angled side against the plate of the saw blade — not the teeth.

▲ ***Set the Angle.*** *Use the head of a combination square to set the miter gauge at exactly 45°.*

**Other Angles.** If you're cutting miters that aren't 45°, there are a couple of commercial gauges that will give you perfect results (refer to page 51 for sources). The *MiterSet* (top) uses a pair of pins to set the angle in 5° increments. For example, with in-between miters, a notched bar will tweak the setting up or down in ½° steps.

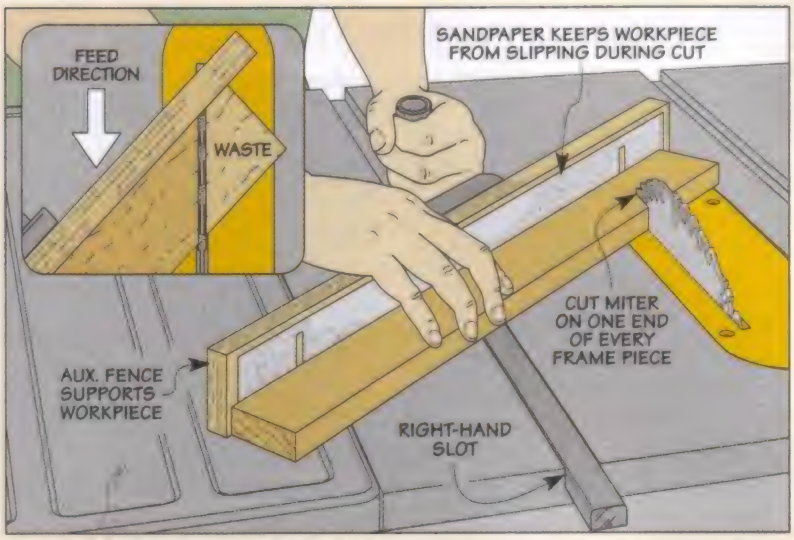
The *MiterMatic* (bottom) also uses pins to set the head of the miter gauge. Three rows of holes drilled along one edge match common angles (90°, 45°, and 22.5°) as well as the settings for multi-sided shapes.



# cutting the Miters

Taking the time to get your saw set up and tuned for cutting miters will go along way toward eliminating mitering troubles. However, it's only the first part of the process. The next two parts (cutting and assembly) are just as important in completing the job.




▲ ***The First Cut.*** *Once the table saw is set up, make a miter cut on one end of all the pieces. After you complete the cut, slide the workpiece away from the blade to avoid leaving blade marks.*

## CUTTING

Making the cuts is pretty simple. However, there are a few things I'd like to point out.

For a mitered frame, there are eight cuts you'll need to make (one on each end of the four workpieces). Half of these cuts will be made from the right side of the blade. For the other four cuts, the miter gauge will slide in the left slot with the head rotated 45° in the other direction. As you are making the cuts, it's easy to get mixed up. Trust me, I know. That's why I like to start by mitering one end of all the parts before moving the miter gauge to the other side of the blade. I find that this saves some time and means I don't have to reset the angle as often. You can see this in the drawing above. (If the parts you're cutting are small, you may want to consider making the sled shown in the box at left.)

**Hand Position.** Another thing to note in the drawing is the position of my hands. My right hand holds the workpiece firmly against the fence and down on the table. My left hand pushes the miter gauge past the blade. (For the cuts made in the left miter gauge slot, just reverse hand positions.)

As you make the cut, push with consistent pressure without forcing the piece being cut through the blade. This way, the blade is doing all the work and you end up with a smooth, straight miter.

Then when the cut is complete, there's one last thing to do. And that's to slide the workpiece *away* from the blade before pulling the miter gauge back. This prevents any chance of the blade catching and spoiling your cut.

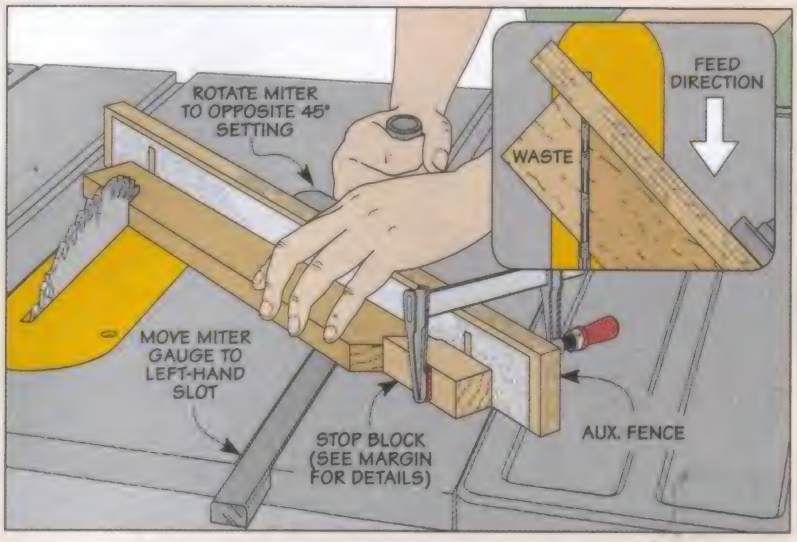
**Second Cut.** After cutting a miter on one end of every part, you're ready to make the second miter cut on the other end of the boards. Start by moving the miter gauge to the left slot and rotating it to the opposite 45° setting.

With this second cut, you'll be cutting the pieces to their

## cutting small parts: Miter Sled

Cutting clean, accurate miters on small, delicate pieces of molding can be tricky. One solution is to use a sled like you see in the photo below. I like to think of it as a miter box for the table saw.

The sled easily clamps to the miter gauge so there's not a lot of setup needed. The pre-cut slots at each 45° setting make it a snap to line up the piece correctly on a layout line. A ¼" hardboard base supports thin, flexible workpieces and carries them past the blade. I attached a strip of self-adhesive sandpaper to the tall rear fence to keep the parts being cut from slipping. The front fence keeps the sled rigid for chatter-free cuts.




▲ ***Second Cuts.*** *With the miter gauge in the left slot and rotated to the opposite 45° setting, make the final cuts to length. A stop block ensures that the opposite sides are cut to identical lengths.*

finished length. And for the final assembly to be tight and square, the opposite sides need to be the exact same length. To do this, I clamp a mitered stop block to the end of the fence, as shown in the margin and drawing above.

Cutting the second miter goes about the same as the first. The one big difference comes at the end of the cut. Since the stop block traps the workpiece, you can't just slide it away from the blade.

Here, you have two choices. You can either push the piece clear past the blade before removing it from the miter gauge. Or, you can turn off your saw at the end of each cut and remove the piece once the blade stops spinning.

## ASSEMBLY

When you've finished cutting all the parts to length, you'll need to assemble them into a complete frame. By this time, you're ready to see some results. So it's tempting to reach for a band clamp and glue up the frame in one operation.

The problem with this technique is there's just too much going on. It's a challenge to juggle four workpieces, the glue bottle, and the clamp and still end up with four joints that are flush and tight.

**One at a Time.** Instead, I find I get better results by taking it one corner at a time. This relaxed approach gives you a chance to be certain everything is just right.

To make sure the joints are square as they're glued up, I use a simple clamping form like you see in the two drawings below. The block provides a perfect guide for keeping the parts aligned and square. The clamping force is supplied by hand pressure. (Another option is the miter vise on page 36.)

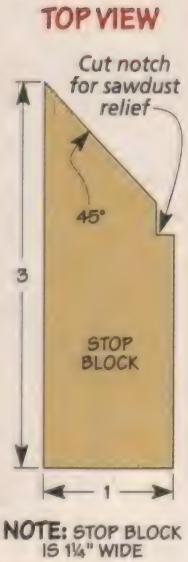
**Corner Assembly.** Gluing up a corner simply requires applying glue to the mating faces. (I use a fast-setting glue.) Then hold the pieces together until the glue sets. This will only take a few minutes.

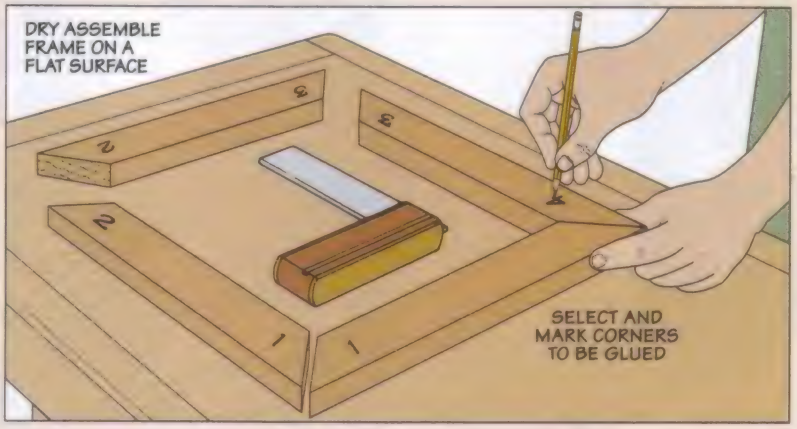
**Two Halves.** Rather than work my way around the frame, I use the remaining unglued pieces to make up the second corner. This creates two L-shaped assemblies. A side benefit is I don't have to wait for each corner to dry completely before moving on.

When the two assemblies are dry, you can glue them together. Now you have two options.

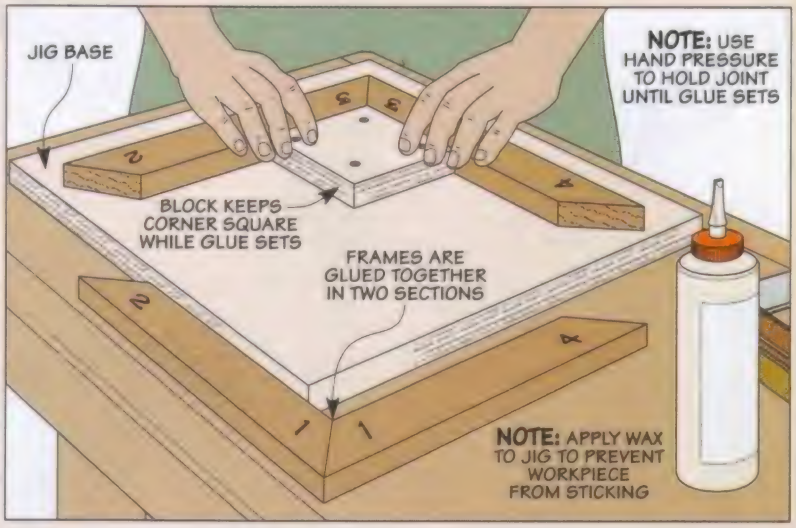
**Final Assembly.** For small frames, you can apply glue to each joint and pinch both closed at the same time. On larger frames, on the other hand, I glue each joint separately. But getting glue into the last corner can be a bit of a challenge. The way around this is to dab some glue on a playing card and drag it between the mitered faces.

Your efforts will pay off with a perfect fitting frame you'll be proud to show off.




◀ ***Label Corners.*** *To avoid confusion while gluing, label the corner joints.*




◀ ***Gluing Up.*** *Apply glue and "hand" clamp the joint together until the glue sets up. A backer block will help keep the pieces square.*

# shop-made Miter Vise

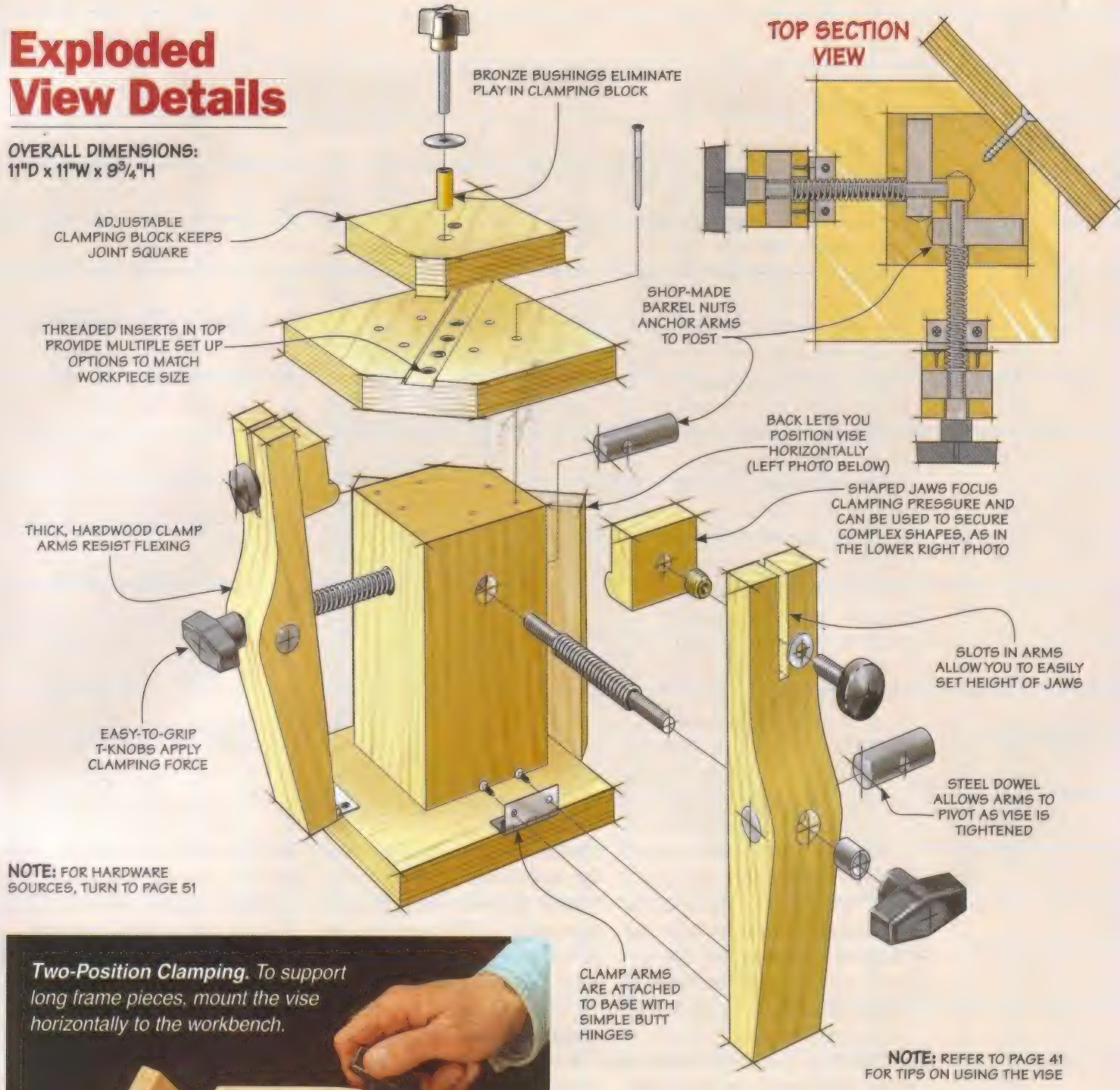
This simple vise makes assembling miters as easy as 1-2-3.

Miter joints are some of the toughest joints to glue up. The angled pieces tend to slip around as you apply clamping pressure. And getting a flush, gap-free joint often ends up more like a juggling act. But with the miter vise shown in the photo below, clamping miters is a snap.

As you can see in the drawing on the next page there are a lot of features packed into this capable vise. But what stands out is the stout construction. The thick blocks of hard maple and Baltic birch plywood will stand up to heavy use. Don't worry. As you'll see, building it isn't complicated and won't take much time.

# Exploded View Details

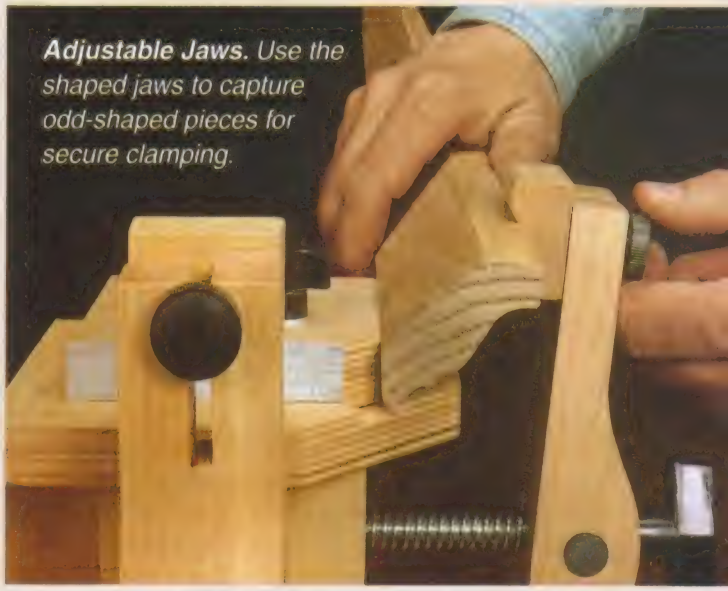
**OVERALL DIMENSIONS:**
**11"D x 11"W x 9¾"H**




**NOTE:** FOR HARDWARE SOURCES, TURN TO PAGE 51

**NOTE:** REFER TO PAGE 41 FOR TIPS ON USING THE VISE

***Two-Position Clamping.*** *To support long frame pieces, mount the vise horizontally to the workbench.*



***Adjustable Jaws.*** *Use the shaped jaws to capture odd-shaped pieces for secure clamping.*

## strong and sturdy

# Stand

For a secure hold and tight joints time after time, the miter vise must be stout. You don't want any slipping or flexing to spoil the glueup. The solution is the main section of the vise — the stand.

As you can see in Figure 1, the stand isn't really that difficult to build. The top is where all the action takes place, so it's built for accuracy and adjustability. Under the top is a thick post. And the base and back are a pair of platforms that allow the vise to be clamped either vertically or horizontally to a workbench.

**Post.** At the heart of the stand is the hardwood post. (I glued it up from a few pieces of hard maple and then cut to size.) The next steps involve drilling some holes.

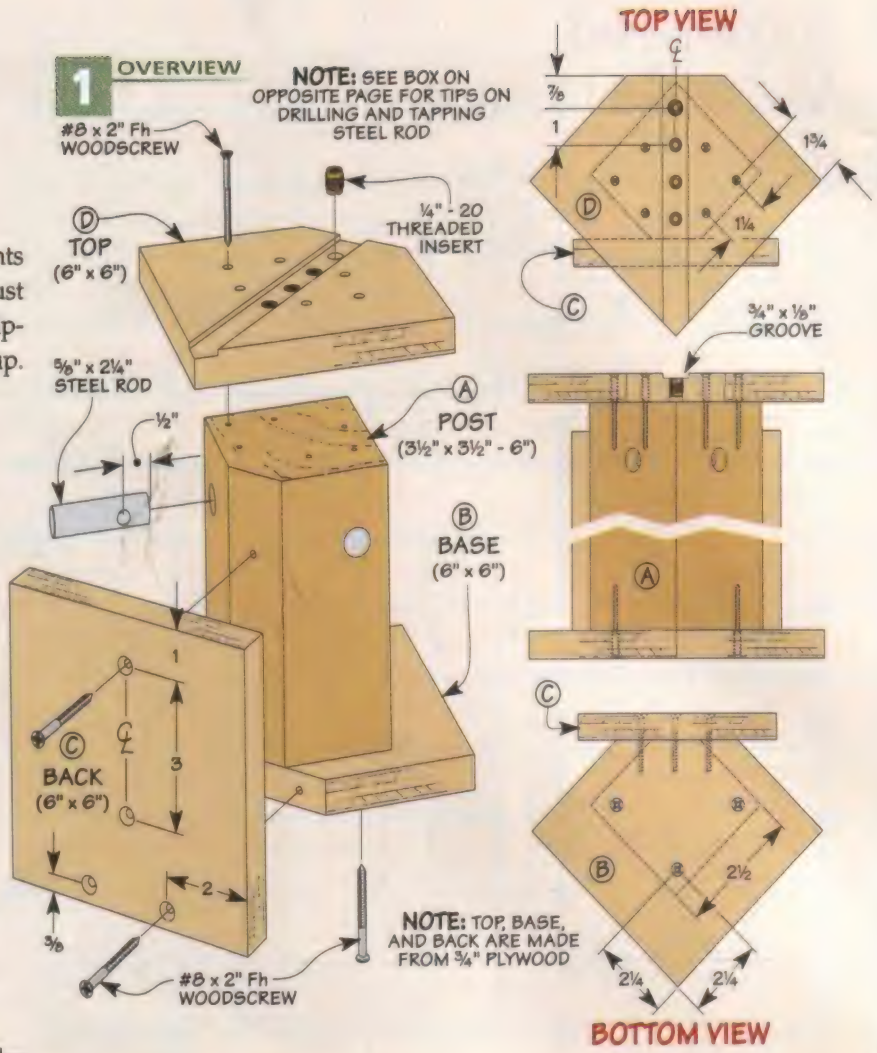
The first set of centered holes is for a ⅝"-dia. threaded rod that attaches the clamping arms to the post, as shown in Figure 2. An intersecting set of holes will hold shop-made barrel nuts. You can find the procedure for making these nuts in the box at the bottom of the opposite page.

The final detail on the post is to cut a bevel on one corner. This creates a flat surface for attaching the back that you'll add later.

**Base.** The post is attached to a plywood base. This makes it easy to clamp the vise to a workbench or table. Like the post, one corner of the base is clipped to provide clearance for the back, as in Figure 1.

**Back.** Once the base and post have been attached, you can make the vise back. It's simply a square piece of plywood that serves as a clamping surface when you use the vise horizontally.

But before attaching the back, you'll need to install the barrel nuts. You want to take care that the holes in the nuts are aligned with the holes in the post. Then you can screw the back in place.

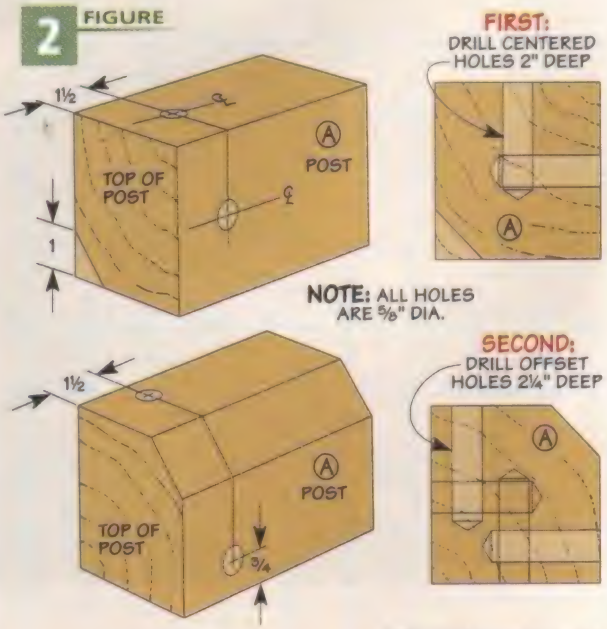



## Materials

| | | | | | |
|---|---|---|---|---|---|
| A | Post (1) | 3½ x 3½ - 6 | E | Clamp Block (1) | 4 x 4 - ¾ Ply. |
| B | Base (1) | 6 x 6 - ¾ Ply. | F | Guide (1) | ¼ x ¾ - 5⅝ |
| C | Back (1) | 6 x 6 - ¾ Ply. | G | Arms (2) | 1½ x 1¾ - 9 |
| D | Top (1) | 6 x 6 - ¾ Ply. | H | Jaws (2) | 1 x 1½ - 1¾ |

## Hardware

- (14) #8 x 2" Fh Woodscrews
- (2) ⅝" x 2¼" Steel Rods
- (6) ¼" - 20 Threaded Inserts
- (2) ¼" I.D. - ⅞" Bronze Bushings
- (1) ¼" - 20 x 1½" Studded Star Knob
- (1) ¼" Fender Washer
- (2) 1½" Butt hinges w/Screws
- (2) ⅝" I.D. x ½" Nylon Bushings
- (2) ⅝" - 18 x 5½" Threaded Rods
- (2) .062" x ½" O.D. -3" Comp. Springs
- (2) ⅝" x 1¾" Steel Rods
- (2) ⅝" - 18 T-Knobs
- (2) ¼" Flat Washers
- (2) ¼" - 20 x 1" Studded Rnd. Knobs



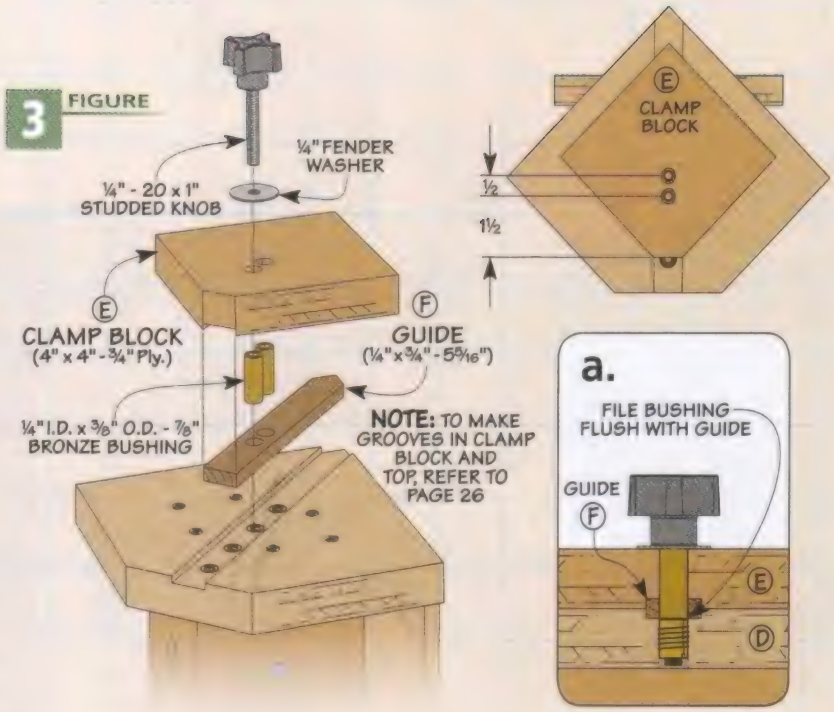
**Top Assembly.** The final pieces of the stand to make are the top and clamp block, as you can see in Figure 3. The clamp block is attached to the top with a studded knob that fastens into a series of threaded inserts in the top.

With two holes in the clamp block and four inserts in the top, it gives you a great amount of flexibility to set up the vise to match the width of the workpieces.

As the vise arms are tightened, the clamping pressure could cause the pieces to shift out of alignment. To prevent this from happening, there's a hardwood guide that runs in a shallow groove in the top. This keeps the clamp block and the workpieces square. You'll find the step-by-step process for making these pieces in Shop Short Cuts on page 26.

**Install Hardware.** Once the pieces have been made, you can install some hardware. First, drive the threaded inserts into the top, making sure they are square and flush with (or slightly below) the bottom of the groove.

Next, you can fit some bronze bushings into the clamp block. The bushings maintain a solid, wiggle-free connection between the clamp block and top (Figure 3).




Depending on the bushing and thickness of the plywood, you may need to file the bushing flush with the block and guide, as you can see in Figure 3a.

There are just a couple more things to take care of before moving on. The first is to apply some self-adhesive sandpaper to the edges of the clamp block. This will help prevent the workpieces from creeping as the vise is tightened.

The second thing to do is apply a few coats of finish and wax to the top. Then you can easily "pop" off any glue that squeezes out of the miter joint you're working on.

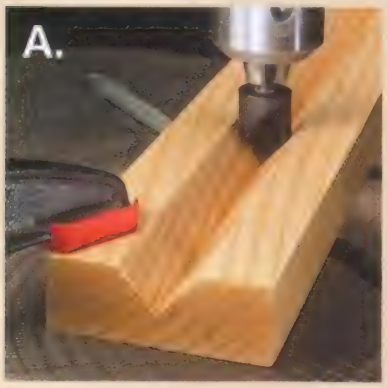
At this point, the vise stand is complete. On the next two pages, you'll find the details for making the clamping arms as well as some tips for gluing up a perfect-fitting miter joint.

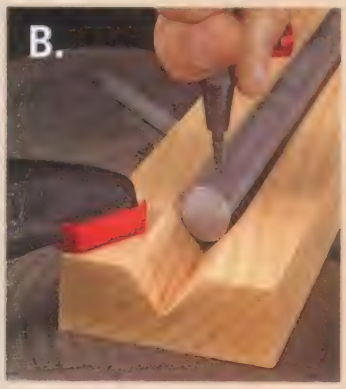
# Drilling & Tapping Steel Rod

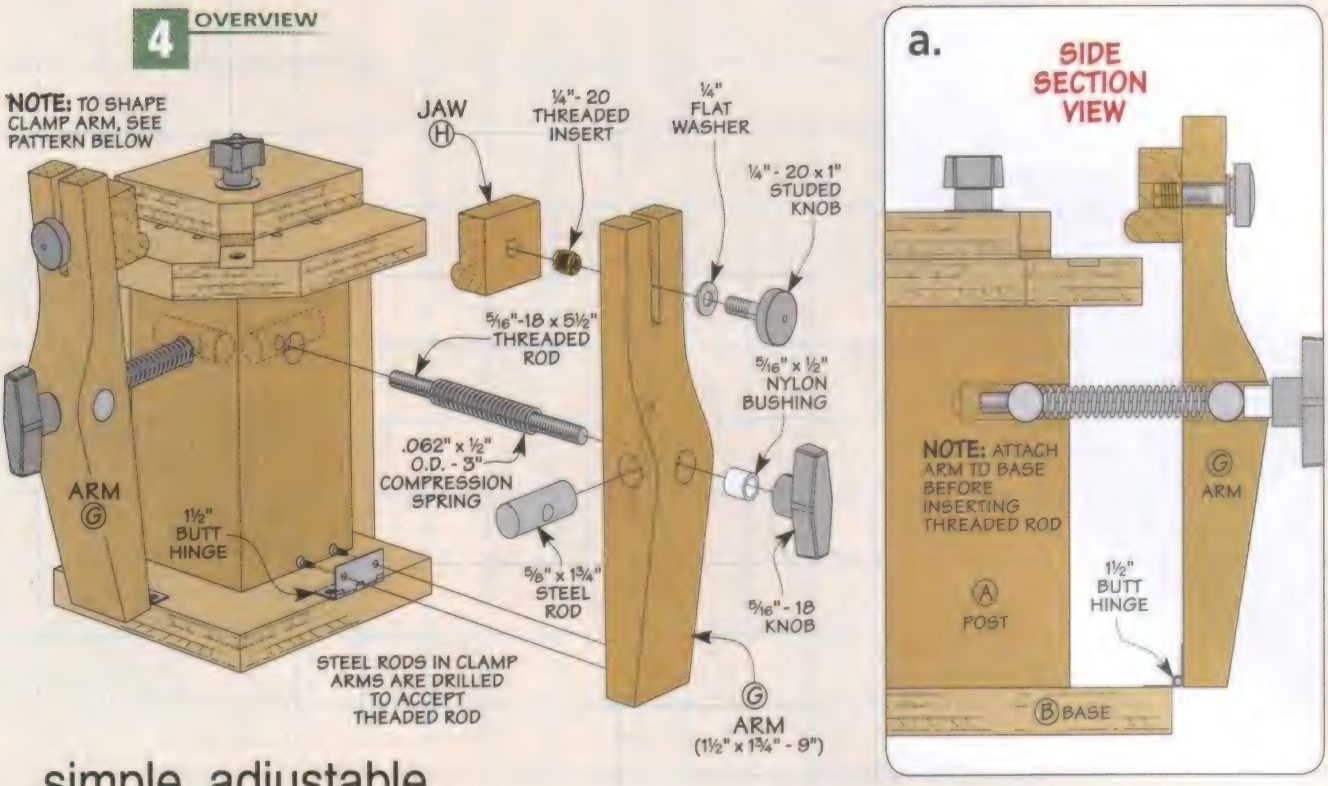
You'll need to make two different pieces of hardware from short sections of steel rod. As you can see on the far right, one piece is tapped to accept a piece of threaded rod. The other one is drilled to allow the threaded rod to pass through (left rod).

Making the parts follows the step-by-step process shown in the photos below. (You'll have better control if you start with extra-long pieces of steel rod.) I made a simple V-block to cradle the rod and used a countersink bit to center the block on the bit (photo A). After marking the location of the hole, use a centerpunch to create a starting "dimple" for the bit (photo B).

Drilling the holes is straightforward. Clamp the rod in place and use a slow speed with light oil to keep the bit cool, as shown in photo C. Finally, tap the holes in the barrel nuts before cutting them to length (photo D).






simple, adjustable

# Clamp Arms

The stand you just completed makes up half of the clamping action of the vise. The other half is done by the arms. The clamping force is supplied by a threaded rod and large T-knobs, as illustrated in Figure 4. At the top of each arm is an adjustable jaw. The jaw rides in a slot so it can be positioned to exert pressure in just the right place (see box on facing page).

**Arms.** The arms of the vise have a unique shape. The thinner top portion holds the studded knobs used to secure the jaws. And the thick middle section provides plenty of strength and rigidity for clamping down tightly.

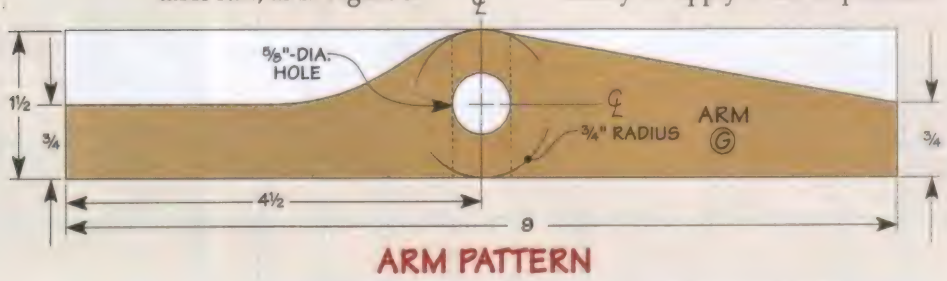
To make the arms, I started with an oversize blank. After drilling intersecting ⅝"-dia. holes in the blank, a slot is cut in one end at the table saw, as in Figure 5.

With the slot cut, the next step is to cut the arms to shape from the blank. You can use the pattern below as a guide for making these cuts on the band saw.

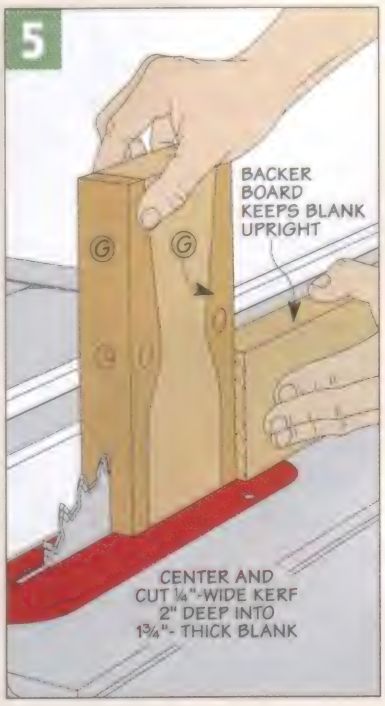
**Some Hardware.** Connecting the completed arms to the stand is the next step. And here you'll have some hardware to deal with. The first thing to do is attach each arm to the stand with a butt hinge.

Next, you'll make a pair of short steel rods. These rods have clearance holes drilled in them to allow the threaded rod to pass through. They're made nearly the same way as the barrel nuts in the stand (only without the tapping step). When they're complete, slip the rods into place in the clamp arms.

Like I mentioned earlier, a length of threaded rod gives the arm the ability to apply a lot of pressure. You can glue the rod to a T-knob with epoxy and then fit a nylon bushing on one end of each rod, pushing it through the hole in the arm, as in Figure 4. A spring is then added that allows the arm to retract as the pressure is released. And the whole assembly can be threaded into the barrel nuts in the post, as you can see in Figure 4a.




ARM PATTERN



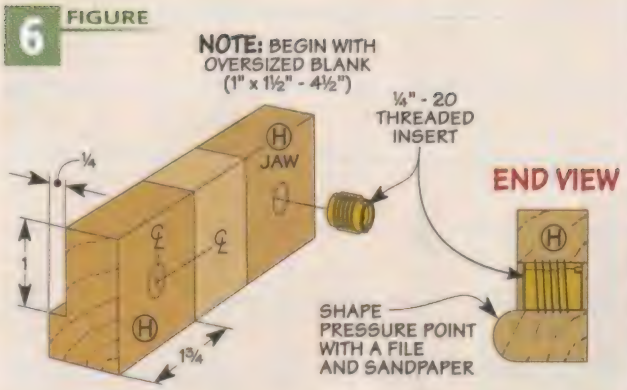
**At Last, the Jaws.** The final parts of the vise to make are the adjustable jaws (Figure 6). Since these pieces are too small to work with one at a time, I did as much of the work as I could on an oversized blank, as shown in Figure 6.

The first thing to do is drill some holes. These hold the threaded inserts that are used to attach the jaws to the arms.

Next, you can create a pressure point on each jaw with a file and some sandpaper. This point allows you to concentrate the clamping pressure on a narrow area.

Finally, each jaw can be cut to length and attached to the arms. And with the vise complete, you're ready to put it to use. You'll find some tips for getting the best results in the box below.

FIGURE 6

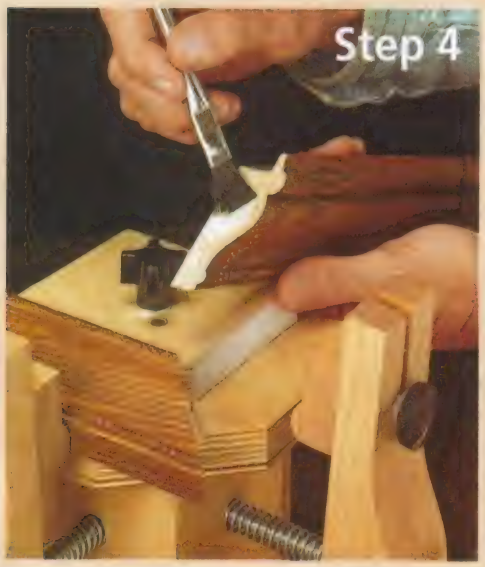


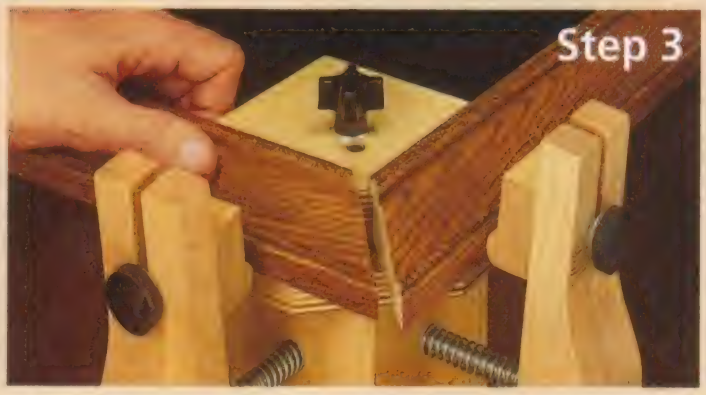

## Tight Miters: Step-by-Step

The miter vise eliminates the frustration of clamping tight miter joints, as shown in the photo at right. But the real starting point is making sure the pieces are cut at a perfect 45°. For a few tips on this process, take a look at the article that starts on page 32.

When you're ready to assemble the joint, you can follow the steps shown below. However, there are a few other things I'd like to highlight as well. The first thing is setting the position of the clamp block, as shown in Step 1. I set it so that when a workpiece is clamped, it's fully supported by the top. This helps keep the pieces flat and square to each other. This way the joint will be flush.

Another thing to mention is the importance of doing a dry run (Steps 2 and 3). This way, you aren't in a panic trying to get everything aligned while the glue is starting to dry. Once you have everything set, then you can calmly and precisely glue up the miter. Finally, I leave the joint in the vise for about an hour before moving on.




***Step 1.*** *Position the clamp block so the piece is supported by the top and the arms are vertical.*

***Step 2.*** *Now, set the height of the jaws and loosely clamp the workpiece in place.*

***Step 3.*** *Slide the mating piece in place and check the fit of the miter joint. Adjust each piece until the joint is aligned.*

***Step 4.*** *To glue up the miter, loosen one piece and brush glue onto the joint. Then place it in the vise and snug up the arms.*

*Drive Them Home.* Using the right settings and techniques allows a cordless drill to drive screws with minimum effort.

# get the most from your Cordless Drill

## There's more to using a cordless drill than just pulling the trigger.

A cordless drill has become a "must-have" tool for any shop. Not only is it necessary for drilling holes, but it makes the mundane task of driving screws quick and easy. Its power, versatility, and convenience make it so popular.

When I got my first cordless drill, I didn't spend a lot of time learning about the settings and switches. I'd just squeeze the trigger and go to work. But after stripping a few screw holes and breaking off a couple of screwheads, it didn't take long to learn that the drill's features provided better control for drilling holes and driving screws.

**Trigger.** The most obvious control feature is the trigger. And at one time, drills had only one speed. So, the trigger was basically just an "on/off" switch.

Today, many drills come with variable-speed triggers. The more you depress the trigger, the faster the motor spins the chuck. And that feature adds a lot of control, especially when driving screws.

Here's one easy way to put this handy feature to work every day. After drilling a pilot hole, set the screw in place and gently pull the trigger. As the screw cuts into the wood, gradually increase the speed to drive the screw home. That's a lot easier than getting cramps in your forearms trying to drive screws into hardwood with a regular screwdriver.

### SETTINGS

Another feature I like is a dual-speed motor. Many drills today have two speeds (photo on opposite page), and some newer models have three speeds.

The dual-speed switch sets the range of speeeds the drill spins at. For example, the high-speed setting has wide range (up to 1,200 RPM) for drilling holes. But the low setting (up to 400 RPM) produces more torque and better control when you need to drive screws.

You might think that variable-speed triggers and two speed settings would be enough for any task. But there's one more feature that's the perfect complement to the first two, and that's the torque control, or the "clutch."

**Clutch.** As I mentioned earlier, variable speed is a great way to start a screw. But many times, I tried to install the screw just right with short, quick pulls ("rapid fire") of the trigger. But that often results in mangled screwheads, a jumping bit, or worse, a scarred workpiece.

This is where the clutch comes in (photo on opposite page). The numbers around it represent resistance settings, similar to a torque wrench. When the chuck reaches a certain amount of strain, the drive shaft of the drill releases. That's the clicking sound you hear — the motor is still turning, but the driver bit isn't.

**Torque.** The number of clutch settings varies by model, but the basics are the same. For example, low-numbered settings are for driving small screws and working

### CORDLESS DRILL DOs & DON'Ts

***Do:***

- Use speed and clutch settings properly
- Use correctly sized driver bits
- Start slowly and increase power
- Practice your technique for best results

***Don't:***

- Force tight screws
- Use drill setting to drive screws
- "Rapid fire" trigger to drive screws

◀ **Drill Mode.** *To drill holes with a cordless drill, turn the clutch to the "drill" icon and set the speed to "high."*

in soft wood. The torque resistance is low, and the clutch releases under little strain. As you adjust the clutch to higher settings, the release point increases. That makes the higher numbers better for driving larger screws.

This capability prevents you from stripping a screw or overdriving one once it's snug. It also protects the drill by not allowing you to burn up the motor trying to force a screw that won't go any further.

**Drill Setting.** After the highest clutch setting, you'll see an image of a drill bit (far right photo). That's the drilling mode. It locks the clutch so it won't release, giving you full power to drill holes.

## TECHNIQUE

With these controls in mind, you're ready to put them together with the proper technique to get more out of your cordless drill. The ultimate goal here is to install screws so the head is set perfectly flush.

But it's going to take some practice. To get it right, you'll want to work on your technique in a scrap piece of the project wood.

Next, double-check the driver bit you plan to use to ensure it's the right one for the job. If the bit is too small, it will jump around in the screwhead. If it's too large, the screwhead may strip out.

After drilling pilot holes, start with a low clutch setting. Then, simply adjust the clutch to a higher setting and drive a few more screws until the clutch releases when the screwhead is seated flush.

At this point, I know the drill is dialed-in with the right settings. So I can drive screws into my project with speed and efficiency.

Using the proper settings and the right technique will go a long way to making full use of your drill's capability. Another important performance feature is a fully charged battery. For more information on that, see the box below.

▲ **Charge It Up.** *To avoid battery damage and overcharging, most chargers contain internal logic controls.*

# Extend Battery Life: Smart Chargers

While correct settings and technique improve a drill's performance (and your results), that performance is still dependent on the battery. At one time, you had to be careful about how and when you charged a battery to get the most out of it. But that's not the case anymore.

Now, a battery typically can be slipped into the charger and recharged at the first sign that it's losing power. And with its internal logic, a charger is smart enough to let you know when it's fully charged, or if there's a problem to be aware of (inset photo).

All this ensures that your batteries will be fully charged and ready to use when you need them. And that they'll stay in good shape for a long time.

# small space Workshop Secrets

## Gain some extra space in your shop by grouping your power tools and workbench in these efficient combinations.

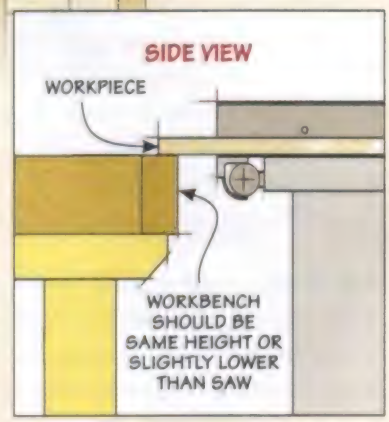
Working in a small shop can seem more like walking through a maze than an enjoyable place to spend an afternoon. So, one of the challenges you face is adding a new power tool. Most of the time, I would simply place it anywhere it would fit. And it just stayed there.

But after rearranging my shop a number of times over the years, I've finally come up with a few "combos" that make my shop easier and more efficient to work in. The idea here is to arrange tools in small groups. Take a look at these three solutions and see if you can get more out of your shop space.

### CENTRAL WORKSTATION

When I first started woodworking, the table saw and workbench were the first two "tools" in my shop. So I placed them back-to-back in the center of the workshop.

**Benefits.** There are a few advantages to this setup. The first is my bench can act as a large, outfeed support for the table saw. Just make sure your bench is the same height or a tad lower than your saw (inset drawing above). This makes it perfect for handling sheet goods.

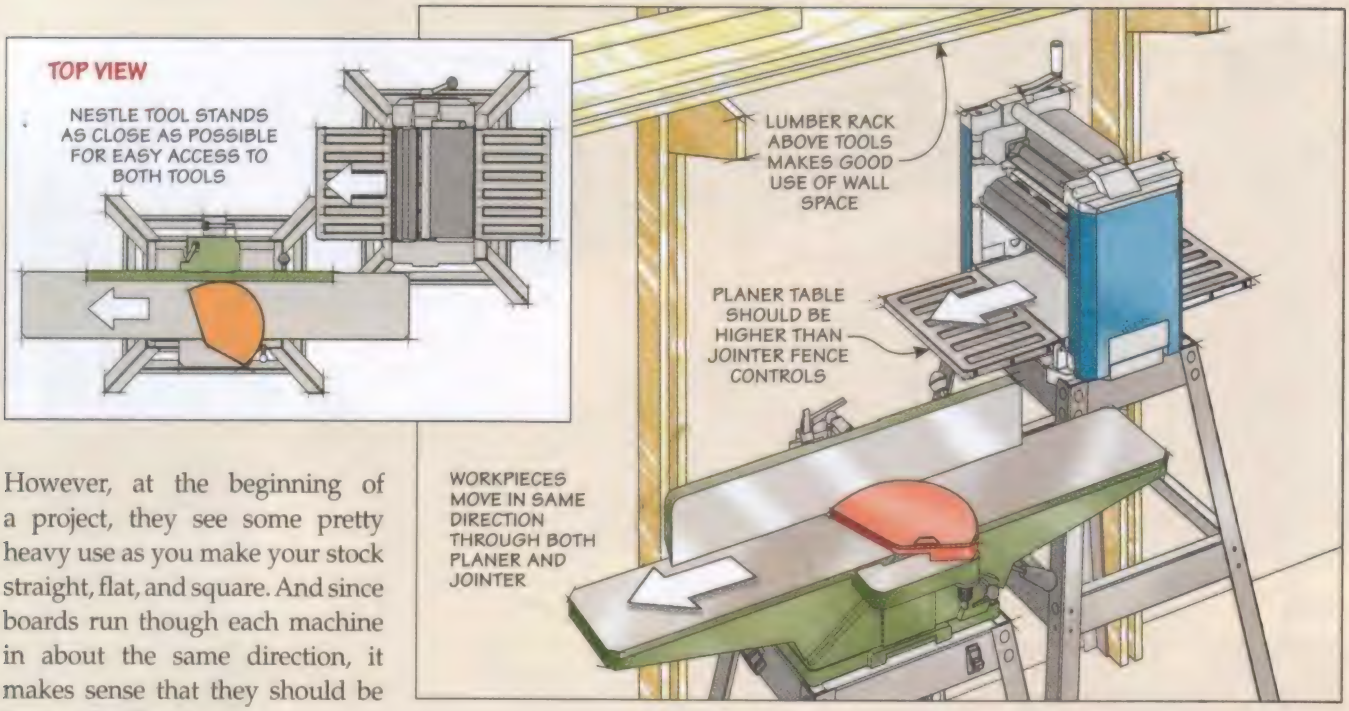



Another plus is that the combined size of the saw table and bench makes an extra-large glue-up and assembly station.

**Another Option.** In the left drawing, you can see another version of this pairing that might suit your needs better. Instead of placing the workbench behind the saw, they're positioned apart so that I can work between them. It's like working in a galley kitchen. And I can also use the bench as an infeed table to support long boards and large sheets of plywood.

### PREP TOOL DUO

Another set of tools that works well as a pair is the planer and jointer. These aren't "everyday" machines.




However, at the beginning of a project, they see some pretty heavy use as you make your stock straight, flat, and square. And since boards run though each machine in about the same direction, it makes sense that they should be near each other, too.

If you position them along a wall under a lumber rack, like you see in the drawing above, the setup won't take up much space.

Now you might think this arrangement looks awkward. But unless your jointer is very wide, you still have good access to both tools.

## SHAPING & DRILLING TRIO

The trio of power tools you see in the drawing below may seem to be an odd mix. But there are a couple of reasons why I like them to be positioned close together.

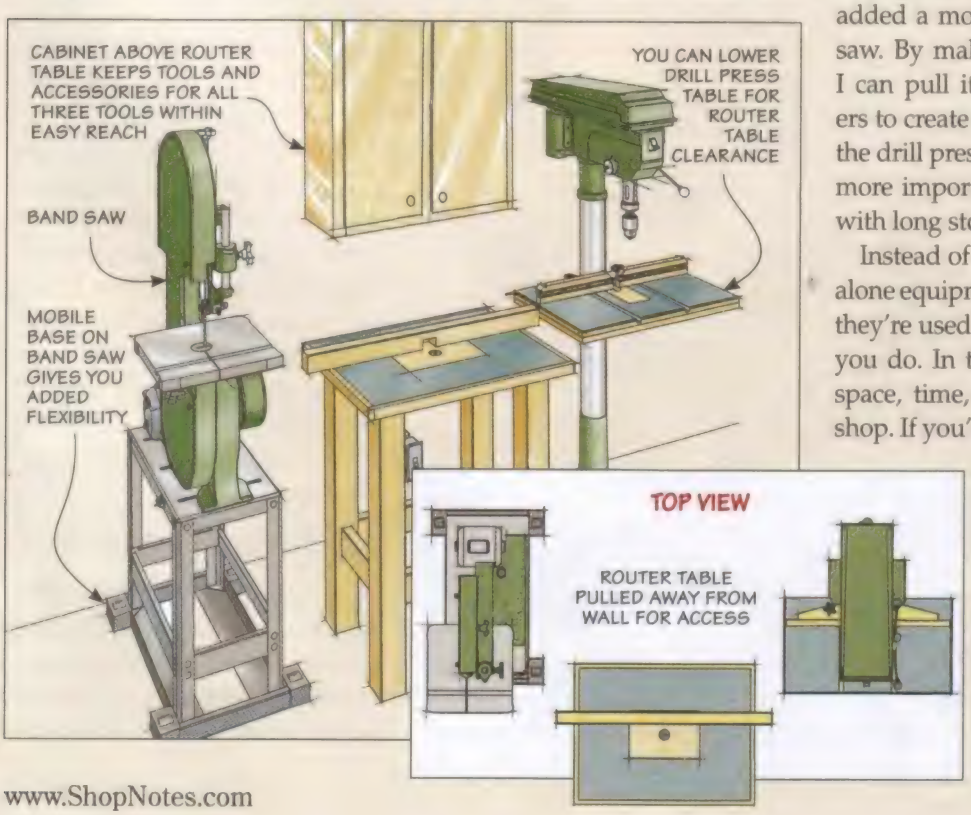
**Working Together.** First, each of these tools works well placed against a wall. And since the router table is usually lower than either the band saw table or drill press table, I position the router table between the other two. The advantage here is that the router table can serve as a handy worksurface for holding parts or accessories while I'm working at either the drill press or band saw.

I've even used the drill press table as an infeed/outfeed table for the router table or band saw. (You can lower the height of the drill press table to provide additional clearance for working with large pieces on the router table.)

Depending on the size and shape of your tools, you may need to do some tweaking of this arrangement. For example, I will usually reposition the router table away from the wall slightly to provide enough clearance to tackle most router table tasks.

**Mobile Bases.** There may be times when this three-in-a-row arrangement doesn't work. So I've added a mobile base to the band saw. By making this tool mobile, I can pull it away from the others to create plenty of clearance at the drill press or router table — or more importantly, when working with long stock on the band saw.

Instead of seeing tools as stand-alone equipment, think about how they're used and the type of work you do. In the end you can save space, time, and trips across the shop. If you're like me, after doing some tool shuffling and creating one or more of these tool groupings, it will feel like you have a whole new place to work. And in my book, that's a good combination.



# the basics of Edgebanding

A narrow strip of veneer and a few simple techniques are all you need to hide the edge of a plywood panel.

Plywood is a great material for building a project. The challenge is finding a good way to hide any exposed edges. And when I need to do that, I turn to edgebanding.

Edgebanding is really just a narrow strip of veneer that matches the plywood. It's available in most of the common hardwoods, like oak, cherry, and walnut. But as you can see in the photo below, you'll also find a few other types of edgebanding that allow you to match, or contrast with, melamine or laminate-covered materials. (For sources, turn to page 51.)

**Plain Edging.** The most basic type of edgebanding is a plain strip of veneer. The trick is gluing the strip in place without having to deal with a lot of clamps. The simplest way to do this is to use contact cement (upper left photo on the opposite page).

**Adhesive-Backed Edging.** If you'd rather not deal with contact cement or liquid glue, check out the adhesive-backed edging shown in the center photo on the opposite page. The glue is already applied to this type of edgebanding, so installing it is just a matter of melting the glue.

To do this, you can use a specialized edgebanding iron. But an ordinary clothes iron set on high works just as well (main photo).

**Pressure-Sensitive Tape.** Finally, the easiest edgebanding option of all uses pressure-sensitive tape (upper right photo on opposite page). Simply press the edgebanding in place, peeling off the protective backing as you go.

*Plain edging, like this 2" wide oak, is the least expensive*

*Pressure-sensitive tape is simple and easy to work with*

*Add variety by using plastic or metal edgebanding*

*Edgebanding with an adhesive back comes in a wide range of materials, widths, and lengths*

## APPLYING EDGEBANDING

Regardless of the type of edgebanding you use, they all perform equally well. So the goal is really to create a virtually invisible joint, which takes just a few simple steps.

▲ ***Plain Edgebanding.*** *Contact cement creates an "instant" bond for plain edgebanding.*

▲ ***Adhesive-Backed.*** *Gluing this material in place is just a matter of melting the adhesive with an iron.*

▲ ***Easy-On Tape.*** *To install this pressure-sensitive tape, just peel off the backing and press it in place.*

**Prep the Edge.** The first step is to prepare the edge. So after I've trimmed the workpieces to size, I smooth the edge with a sanding block and a piece of 220-grit sandpaper. To avoid rounding over the edge, be sure to use a light touch.

**Cut to Size.** After preparing the edge, you're ready to cut the edgebanding to rough length. I've found it best to cut the edging about 1" longer than I need and just let it hang over the ends.

As I mentioned earlier, the basic process of installing edgebanding depends on the type you use (photos above). But once you've applied the edgebanding, I've always found it a good idea to work a roller back and forth along the edge to ensure a tight bond.

This is especially important with the adhesive-backed edgebanding. Since the glue doesn't set up immediately, the edges can curl up. Using the roller (or tapping with a block of wood) ensures a firm bond and a tight joint.

**Trim it Flush.** After the edging is installed, the next step is to trim each end perfectly flush, as in the lower left photo. Finally, you can trim the edging flush with the edges.

Here again, a utility knife works great (center photo below). Just be sure to cut with the grain to avoid tearing out any of the edgebanding.

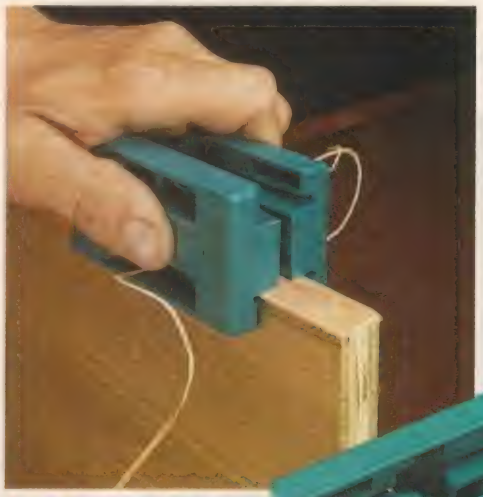
If you have a lot of edgebanding work to do, you may want to consider a custom trimmer, like the one you see in the photo at right. This trimmer has two sets of blades. The first set trims the edging flush with the sides of the workpiece. Then to ease the edge and prevent any possibility of tearing out the edging, the second set of blades bevels the edges slightly.

While this trimmer works great with fairly straight-grained edgebanding, it can result in tearout if you cut against the grain. If that's the case, simply separate the two parts of the trimmer and use the half that works best for the grain.

Edgebanding is a quick and easy way to hide a plywood edge. And it doesn't take much time or effort to get perfect results.

▲ ***Trim the End.*** *A sharp utility knife makes quick work of trimming the end of the edging flush.*

▲ ***Next, the Edge.*** *To trim the edge flush, rest the blade against the face of the workpiece.*



▲ ***Double-Edged.*** *The spring-loaded sides on this trimmer adjust to the thickness of the plywood. Blades along each side trim both edges simultaneously.*

# versatile Micro-Pinners

## Fasten molding and other small parts without splitting or filling nail holes.

My first air-powered tool was a brad nailer. And I've since used it for everything from quickly making shop jigs to assembling cabinets without waiting for the glue to dry. And while I wouldn't give it up for anything, it isn't always the perfect solution.

That's why, in many situations, I'm reaching for my latest air tool — a 23-gauge micro-pinner.

The main difference between a brad nailer and a micro-pinner is the headless pins. They're a bit thicker than a sewing needle. You can read more about them in the box on the opposite page.

What's really amazing about these tools is just how small and versatile they are. The pinner I use is about one-third smaller than my brad nailer. But that doesn't mean it's a wimpy, lightweight tool. In fact, I've never had trouble driving even the longest pins into tough hardwoods like maple or oak.

**Versatility.** The one job where a pinner really shines is installing molding (photo above). The thin fasteners let you quickly and invisibly tack molding or glass stop in place without fear of splitting the profiles. These same qualities come in handy for a variety of other jobs, too (photos below).

### TOP FEATURES

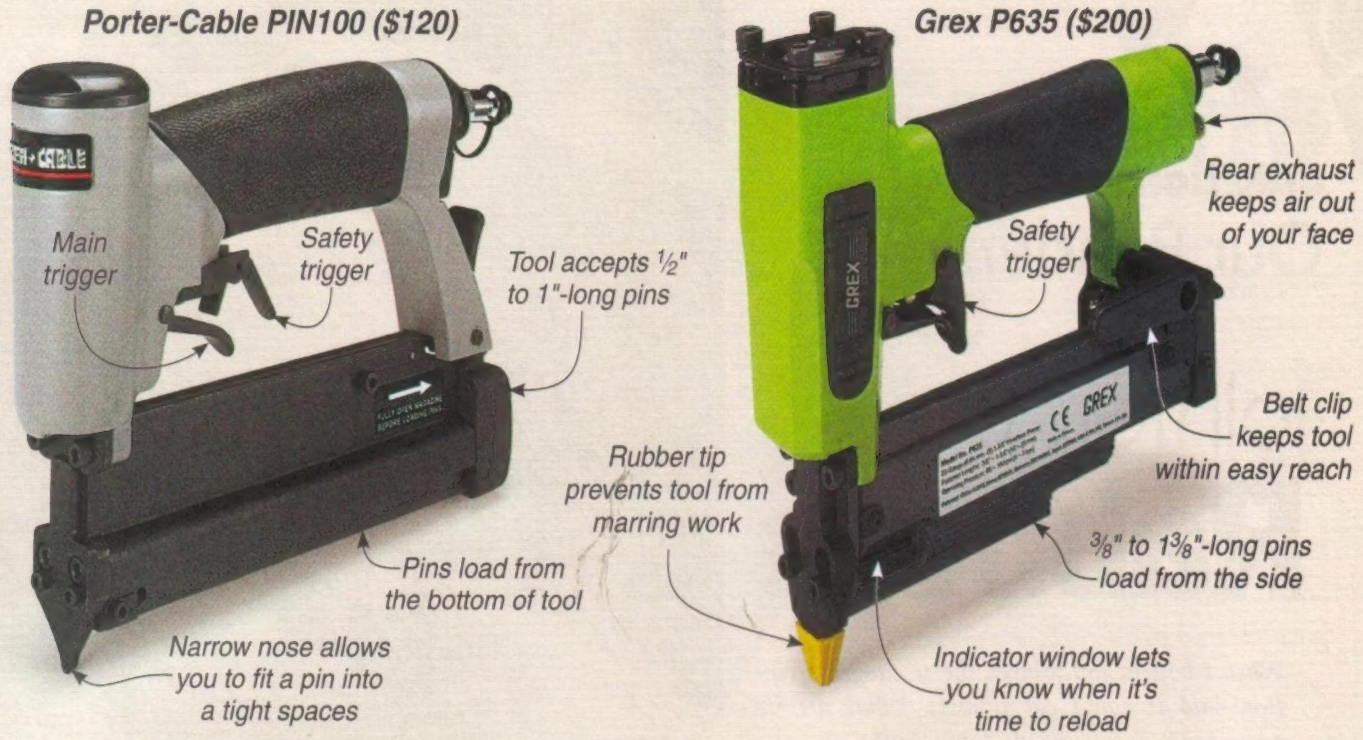
As small as pinners are, they are still packed with features, as you can see in the photos on the top of the next page. I want to mention a few that really stand out.

**Small Nose.** For starters, the tip of the pinner is pretty small. This allows you to aim a pin into tight corners or in the "folds and creases" of molding so that the hole is even less noticeable.

Some pinners come with a soft, rubber nose tip to prevent the metal tip from denting the workpiece.

▲ ***No Clamps Needed.*** *For small projects, like this small cabinet back, you can use pins as "clamps" to hold pieces in place while the glue dries.*

***Miters.*** *Driving a pin into this miter joint provides nearly invisible reinforcement.*




**Dual Trigger.** Pinners have a dual-trigger safety system to prevent accidental firing. This keeps the nose small. Most air nailers have a safety on the nose of the tool that prevents it from firing unless it's pressed against a workpiece.

In order to fire a pin, you first need to pull a safety trigger located between the main trigger and the handle. And each tool has a slightly different style of trigger. This feature may take some getting used to.

It's a good idea to get in the habit of releasing the safety trigger after firing a pin. This way, you won't accidently fire a pin into the air.

**Cost.** As you'd expect, the more features and pin capacity you pack into a tool, the more it's going to cost. In general, you can expect to pay anywhere from $100 for a basic pinner to more than $250 for a high-quality tool. To find the models shown above, turn to Sources on page 51.

**The Big Question.** So do you really need a 23-gauge pinner? If you're trying to decide between a brad nailer and a micro-pinner, start by considering what you want the tool to do for you.

Go with a brad nailer for the big jobs. This way, you can take on cabinet construction without having to tie up your clamps, and speed up routine assembly. The results are hard to beat.

If you're looking for a fast, invisible way to deal with the small details of a project — molding, glass stop or reinforcing mitered frames, then get a micro-pinner. It means you'll never be frustrated by split workpieces or having to fill large nail holes.

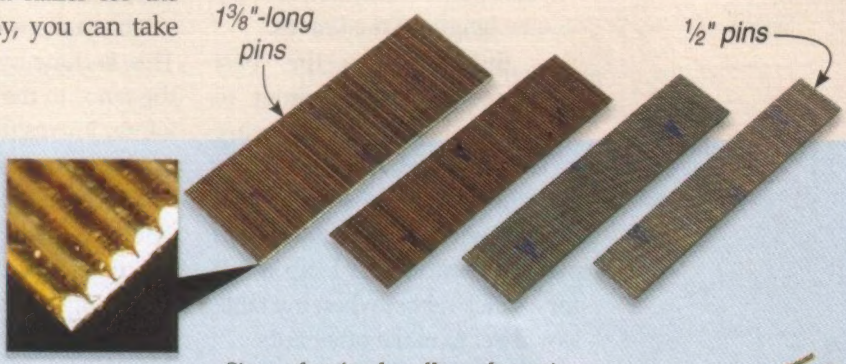
In the end, chances are you'll wind up having both tools in your workshop someday.

# Up Close: Headless Pins

The first thing you notice about 23-gauge pins is just how small they are, as shown in the margin photo at right. They seem almost too flimsy to be effective. But you'll be surprised at how strong they really are.

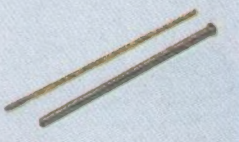
**Almost Invisible.** Besides being thinner than a brad, there's one other difference. The pins are headless. This means the hole a pin leaves is so tiny that you usually don't need to fill it (photo below).

◀ ***Hole Size.*** *The head on an 18-gauge brad leaves a big hole (left). But the hole from a 23-gauge pin is far less noticeable (right).*




Since they're headless, knowing which end is which can be a challenge. But look closely at the tip and you'll see it has a chisel shape, as the inset photo shows. And, to help you out, each stick of pins has printed arrows pointing to the business end.

**Pin Length.** Headless pins come in quite a range of lengths. The smallest are ⅜" long and the longest version tops out at 2". The thing is, no pinner can take the full range of sizes. So you'll need to select a micro-pinner with a pin capacity that matches the work you plan to do. In general, I like to use the longest pins possible for the most holding power.

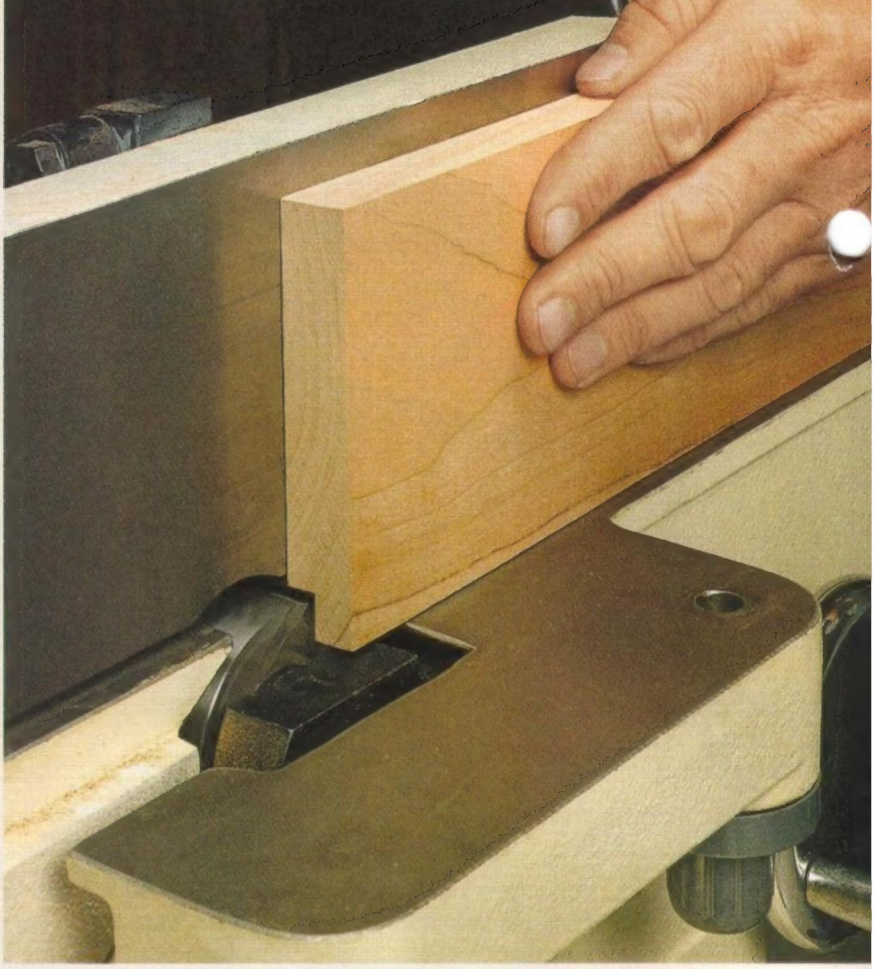


▲ ***Thin is In.*** *Thinner than a brad, a pin won't split molding profiles.*

Q&A

questions from
Our Readers

# jointers & Rabbets



*When I bought my jointer, the catalog description said it could cut rabbets. What are its advantages over using my table saw?*

*Mike Smith*
*Philadelphia, Pennsylvania*

Using a jointer to cut a rabbet has a couple of advantages over using a table saw. For starters, even the best dado blade can leave slight "ridges" in the cut, (top board at left). A jointer makes the cut without leaving any saw marks, eliminating the need to sand or plane them smooth.

Another benefit is that it's easy to cut a wide rabbet. In fact, the width of a rabbet you can make on a jointer is limited only by the length of the knives.

But possibly the best reason to use a jointer to cut a rabbet is the fast setup time. It takes less time to set up a jointer for a rabbet than dealing with dado stacks and an auxiliary fence. And I can use it for a quick rabbet when my table saw is set to make other cuts.

**What is Needed?** One thing to keep in mind is that not all jointer models (such as benchtops) come equipped to cut rabbets. Your jointer needs a rabbeting arm and a notch along the edge of the outfeed table (drawings at lower right). The arm and notch support the edge of the workpiece.

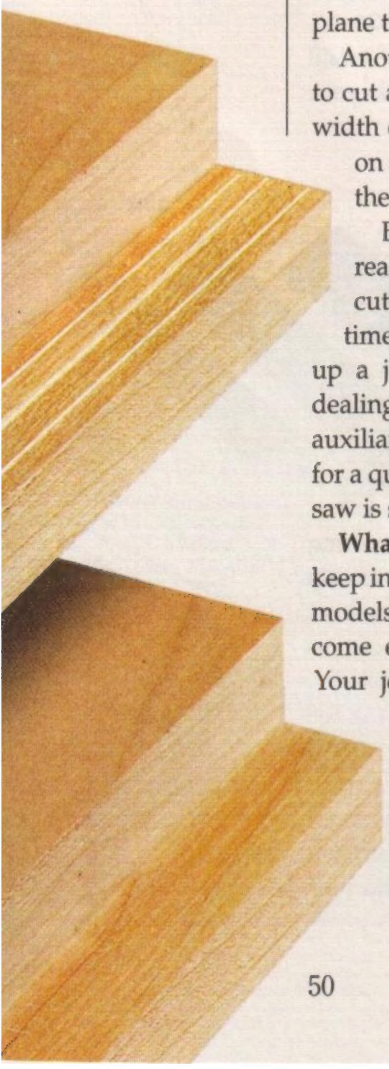
**Procedure.** The first step to cutting a rabbet is to make sure the ends of the jointer knives are aligned. This will ensure the cut is smooth, with crisp edges.

Then, position the fence to establish the width of the rabbet. This is done by measuring from the fence to the end of one of the jointer knives (top photo).

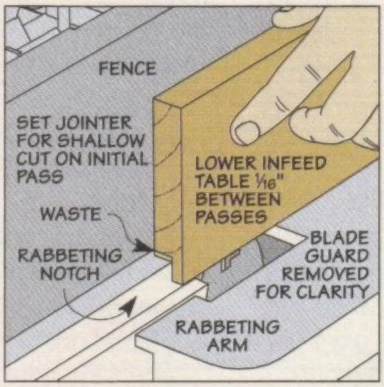
**Shallow Cuts.** Next, adjust the infeed table. Cutting a rabbet safely with a jointer requires making several shallow passes, removing a little bit of material each time. Start by setting the jointer to take a shallow cut (1/16"). (The blade guard has been removed in the top photo to show the setup easier.) After making the first pass, lower the infeed table another 1/16" with each pass until you "sneak up" on the required depth of the rabbet.

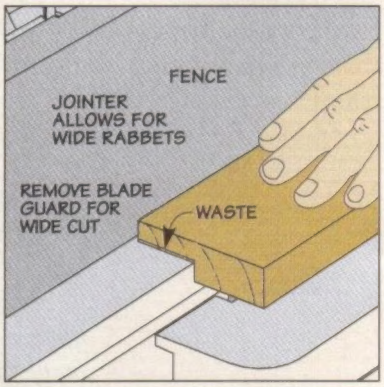
(Even though the knives are "covered" by the workpiece, you should keep the blade guard in place for safety. The guard was removed in the photo for clarity.)

That's really all there is to cutting rabbets with a jointer. If a project called for a lot of rabbets, I'd still use my table saw. But for a few quick cuts, you really can't beat the speed and quality that a jointer can give a rabbet.



◀ ***Smooth Rabbets.*** *A dado blade leaves ridges in a rabbet (top photo). A jointer results in a much cleaner cut.*



# Sources

## HINGE MORTISING

All it takes to rout perfect-fitting hinge mortises is the jig shown on page 8 and a dado cleanout bit. The one used with the jig is a ½"-dia. bit with a ¼" shank. The *Amana* number for this bit is 45460-S and it's available from the *Woodsmith Store* (margin at right).

## EDGEBANDING

Before you order edgebanding like the types shown on page 46, you'll need to determine the type, width, and length you need. Edgebanding comes in wide range of materials and in widths between 13/16" to 2⅜". And the rolls vary in length from 6' to 250' long.

*Rockler* carries all the edgebanding, the iron (68353), and the double-edged trimmer (43208) shown in the article. Edgebanding supplies are also available from the *Woodsmith Store* and other sources listed in the margin.

## DRILL PRESS ACCESSORIES

A drill press is a shop workhorse. And with just a few of the add-on accessories starting on page 14, you can make yours work harder and more accurately than ever.

*Woodcraft* (146709) and *Steel City Tools* (25410) carry the laser system. If low-tech is more your style, you can order a centering pin (50J50.01) from *Lee Valley*. For upgrades to your chuck key, give *McMaster-Carr* or *Lee Valley* a call. And *Woodcraft* has the keyless chuck. The contact information for these sources is listed in the margin.

Finally, hold-downs and vises for your drill press are carried by *Woodcraft*, *Rockler*, and *Lee Valley*. Their websites are a great way to check out what they offer.

## DRILL PRESS TABLE

You can find most of the hardware you'll need to build the drill press table at a hardware store or home center. But some items may be a challenge to locate.

The knobs (23812), T-track (21746), T-nuts (26062), and flange bolts (39532) are available from *Rockler*. And if you decide to add the drawer, the 8" full-extension drawer slides (KV4100 PO8) are available from *Woodworker's Hardware* and the pull (DUH-50) for the drawer is carried by *Reid Tool*.

## STACKING CUTOFF BINS

The stacking cutoff bins on page 28 are assembled with Confirmat-style screws designed for MDF. *McFeely's* carries the 5mm x 40mm screws (5040-CSP) as well as a countersink bit (MS-0540) designed to ensure the head is flush with the surface of the workpiece.

## PERFECT MITERS

Cutting perfect miters is always a challenge. To help set up your miter gauge accurately, you may want to consider the set-up gauges shown on page 32. They're available from *MiterSet* and *Woodhaven*.

## MITER VISE

A hardware store or home center will have most of the hardware you need for the miter vise on page 36. If you have trouble locating knobs, check out the website for *Reid Tool* listed in the margin.

## THIN STRIP RIPPING

You can make ripping thin strips easier with the techniques and jigs starting on page 10. The margin lists sources for specialty saw blades. And *McMaster-Carr* carries the bearing (60355K37) for the long strip jig.

## MICRO-PINNERS

Micro-pinners, like the ones shown on page 48, are fast becoming a must-have shop tool. The *Porter-Cable* model (PIN100) is available from the *Woodsmith Store*. And the *Grex* P635 micro-pinner is available from *Amazon*.

## MAIL ORDER SOURCES

**Woodsmith Store**
800-444-7527
*Dado Cleanout Bit, Edgebanding Supplies, Glueline Rip Blade, Thin Kerf Blade, Porter Cable Micro-Pinner*

**Rockler**
800-279-4441
rockler.com
*Edgebanding Supplies, Glue Line & Thin Kerf Saw Blades, Hold-Downs, Machinist Vise, Knobs, T-Nuts*

**Lee Valley**
800-871-8158
leevalley.com
*Centering Pin, Chuck Keys, Edgebanding Supplies, Tilting Vise*

**McMaster-Carr**
630-600-3600
mcmaster.com
*Bearings, Chuck Keys, Adjustable Lighting*

**Woodcraft**
800-225-1153
woodcraft.com
*Drill Press Laser, Edgebanding Supplies, Hold-Downs, Keyless Chuck*

**MiterSet**
209-835-1626
miterset.com
*MiterSet*

**Woodhaven**
800-334-6657
woodhaven.com
*MiterMatic*

**Amazon**
amazon.com
*Grex Micro-Pinner*

**McFeely's**
800-443-7937
mcfeelys.com
*Confirmat-Style Screws & Drill Bits*

**Woodworkers Hardware**
800-383-0130
wwhardware.com
*Drawer Slides*

**Reid Tool**
800-253-0421
reidtool.com
*Drawer Pull, Flashlight, Knobs*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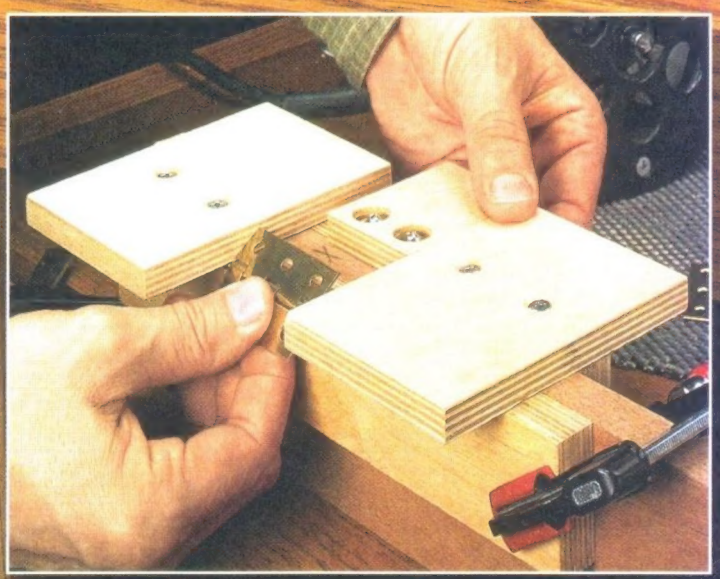
# Scenes from the Shop

*Miter troubles? Take a look at the article on page 32 for some shop-tested tips on cutting perfect miters. Then, with the miter vise you see here, gluing up miter joints will be smooth sailing. Turn to page 36 for instructions on building one. Finally, find out how a micro-pinner can be a valuable addition to your shop on page 48.*



*This simple router jig makes cutting and fitting hinge mortises a snap. To find out how it works, turn to page 8.*